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SIGN,

CARRIAGE & DECORATIVE PAINTING.

INCLUDING FULL INSTRUCTIONS IN

FRESCO PAINTING,

A PRACTICAL TREATISE ON

CAR PAINTING,

AND MUCH VALUABLE

PRACTICAL INFORMATION.

New and Enlarged Edition.

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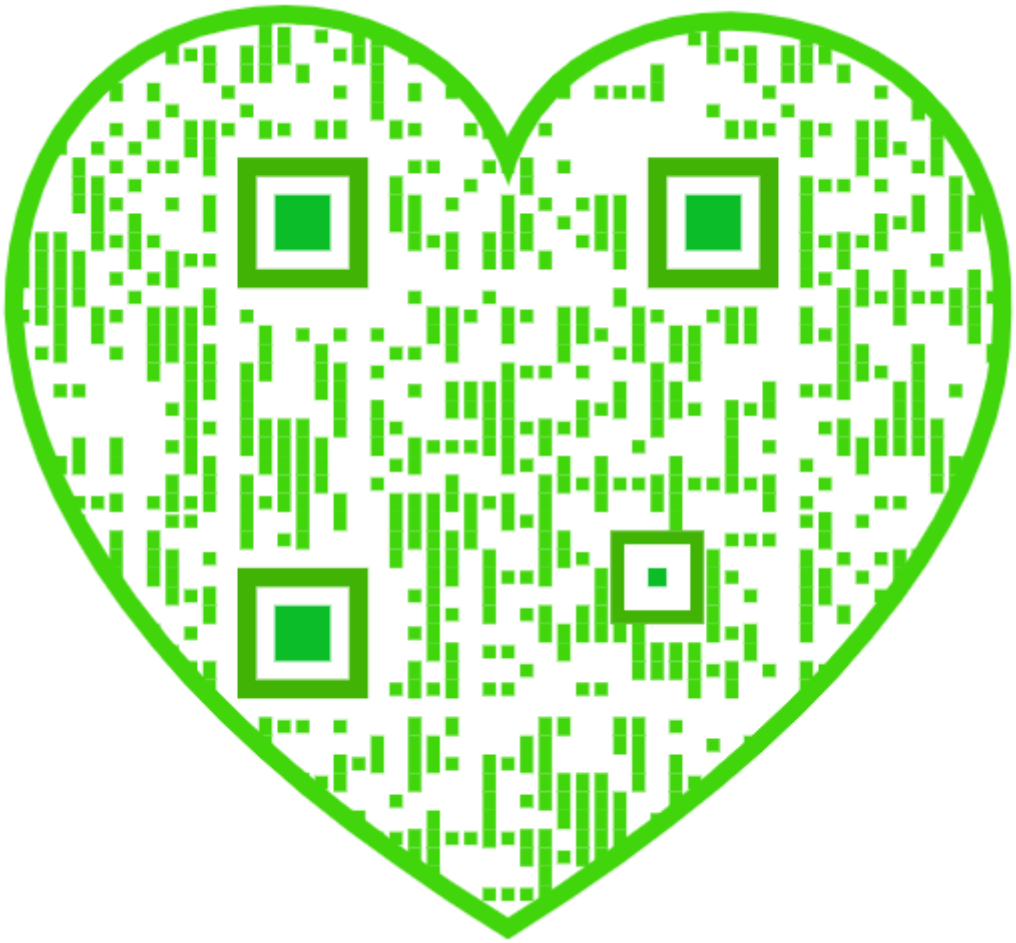

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Sign, Carriage and Decorative Painting.

SIGN PAINTING.

SIGN PAINTING is an art of a very exalted character, and when brought to a state of perfection, viz., true coloring, fine, accurate divisions, and proportions duly balanced, it is entitled to rank with fresco and landscape painting. Indeed, I know of nothing more pleasing to the eye than a sign where all the requirements are brought to bear in perfect unison—"a true sense of color in contrast"—a sweet harmony of tone, a chasteness of composition, upon which the senses can rest with entire satisfaction. These are the points which we wish the reader and learner to attain, and which we shall strive to make intelligible and clear. Too many men learn and hoard up, like very misers, and too many die with the gainings of a lifetime locked in their bosoms, rather than give such knowledge to benefit those who succeed them. And it may reasonably be supposed that the arts and sciences are scores of years behind what they would have been but for this very selfishness.

In everyday practice how often do we see attempts made at sign painting by those who, through ignorance of the first and most essential principles, who know nothing about the true method of preparing grounds, the proper proportioning of the letters, the divisions of distances, parallels, contrasts of color, and other requisites to a good or attractive sign; how often have we seen such signs attempted and become objects of ridicule, even among people who knew nothing of the business themselves? An artistic sign is attractive in more ways than one, and an unartistic one is agreeable to none.

Before entering upon the general outline of procedure, it will be well to give an outline of the nature and properties

of colors employed in sign painting, together with the oils, sizes, varnishes, &c.

COLORS.

RED VERMILION.—This is a bright scarlet, a chemical compound of mercury and sulphur. The best article now in the market is of English manufacture.

RED LEAD.—This is an oxide, of orange tinge, very liable to turn black.

INDIA RED.—This is an ochre, brought from the East Indies; its shade inclines to purple. It works freely and stands well.

COLCOTHER.—A red oxide of iron. It is often called "Indian Red," which is wrong. It is obtained by the distillation or calcination of sulphate of iron. The fine color inclines more to the scarlet than the purple. It stands well.

VENETIAN RED.—A native ochre combined with iron. When well washed, to free it from its sandy particles, is a fine, mellow, pleasant red. It is very useful, and stands well.

RED OCHRE.—Is yellow ochre calcined as deep as the iron it contains will oxidize. A very useful color for shading in gold signs, etc.

CARMINE.—The most valuable of that class of colors, being the heaviest body-color obtained by the manufacture of lake. It is made from cochineal, precipitated by solution of tin; or the best lake from madder, by Sir H. Englefield's process.

CHROME YELLOW.—This is a chromate of lead, and is prepared by the following process: Take a solution of chromate of potash in hot water and add another solution of acetate of lead (sugar of lead). If wanted very pale use a little nitric acid; and if dark shades are required, use bi-carbonate of potash, and by the addition of a few drops of muriatic acid you can deepen the tint down to orange.

NAPLES YELLOW.—This is prepared by lead and antimony. It is much used and stands tolerably well, although of but little use to the sign painter.

YELLOW OCHRE.—This color is a native earth. Some specimens are very bright, and all are durable in oil and work freely.

TERRA DE SIENNA.—This is a brighter and deeper yellow than most of the other ochres. It is found principally in Italy, and is a valuable color.

TURPITH MINERAL.—This is brighter in color than any other yellow, except king's yellow. It works like vermilion, which it greatly resembles in strength of color, etc.

KING'S YELLOW.—Is a combination of sulphur and arsenic. It is a strong poison, but has a deep, rich color, although not durable.

BLUES are principally composed of sulphate of iron and prussiate of potash. These blues are generally called Prussian blue, Antwerp blue, celestial blue, etc. They are all of a fugitive character in oil.

ULTRAMARINE.—This is the richest and brightest of all blues, but is too expensive to be used in house, sign, or ornamental painting, costing usually about twenty-five dollars per ounce. But a very good and cheap substitute has been discovered, manufactured from carbonate of soda, sulphur, cobalt and kaoline. It works well and is durable.

COBALT.—This is the oxide of cobalt, but its manufacture is too complicated to describe in this little work. It is a beautiful shade of blue, and both works and stands well.

GREENS.

BRUNSWICK GREEN—is copper dissolved in a solution of muriate of ammonia. It is a good, pure green and stands well.

CHROME GREEN.—Green chromium is a compound of bichromate of potash and flower of sulphur, but the manufacture is too intricate to find a place here. It is a rich and splendid green. Chrome green, formed by a union of chrome yellow and Prussian blue, can be made of any shade by using more or less of one or the other of the colors. They are very durable.

VERDIGRIS.—Copper reduced by a vegetable acid. It can be used by the addition of a little chrome yellow. It stands well, and is a good color for shading, etc., being transparent.

A beautiful transparent green can be made as follows: Pulverize sugar of lead and blue vitriol (sulphate of cop-

per), then put the two dry powders together; mix them well with the knife on a marble slab or glass. The vitriol and lead, more or less of either, varies the color, making it brighter or darker. This is a beautiful green for glazing gold, or anything requiring a transparent tint. It is durable.

SCHEEL'S GREEN.—Arseniate of potash and acetate of copper. Beautiful, but poisonous, and should at all times be used with extreme caution.

EMERALD GREEN.—A composition of yellow arsenic and verdigris. A most malignant poison. I have known painters to spit blood after merely mixing and grinding forty or fifty pounds of that mineral, and the taste would not leave the mouth for days. Avoid such a color as you value your health.

WHITES.

FLAKE WHITE.—The best formerly came from Italy, where the acid of the grape was employed in the manufacture, instead of commou acetic acid. It is a pure white but liable to change. The flake white made in England and Germany retains its purity to the end.

KREMMTZE WHITE.—This is simply white, corroded in a small scale in "chambers" instead of being done in "stacks," the old Dutch method. It must consequently be free from any sulphate of hydrogen or ammonia, and hence its superiority over the others.

ZINC WHITE.—An oxide of that metal, the result of combustion, commonly called "chemical wool." It is a beautiful white, not quite so full in body as white lead, but possessing no affinity for either sulphide of hydrogen or ammonia, or any other of the obnoxious gases. It retains its brilliant whiteness longer than any white pigment known, with the exception of a white prepared from antimony, which has, however, never as yet become an article of commerce.

BLACKS.

LAMP BLACK.—The soot collected from burning animal or vegetable matter. It should always be calcined before using, as it will then dry better and make better color.

IVORY BLACK.—This beautiful black is prepared by the calcination of ivory and bones in close vessels. It is the purest and most valuable color in the sign painting business.

BROWNS.

UMBER.—The Turkey umber is the best; the English is rated second. They are good drying colors. In their raw state they also class as olive colors, but when calcined are a fine, rich brown. They are good and durable, and also very useful to a sign painter.

TERRA DE SIENNA.—When burned this is a very rich color, much in repute with fresco, sign, and decorative painters. It keeps its color well.

PURPLE BROWN.—This is composed of prussic acid with the oxide of copper. It is a very fine color, and produces with white very fine lilac tints. It is also a good grounding color, and stands well.

ASPHALTUM.—This is a bituminous substance, of a deep, rich brown color; transparent, and a good glazing or shading gold or any other work. It works well with boiled oil or turpentine. It is found on the shores of the Dead Sea and in Judea.

NOTE.—I would here mention the necessity of procuring good, pure linseed oil. This is a very essential point, as many of the oils in the market are adulterated with fish and animal oils, and are, therefore, entirely unfit for use.

DRYERS.

Patent dryers act very well, if pure, but as they are all more or less adulterated with whiting, which imparts a toughness which destroys their fluidity or flowing qualities, I would advise the artist to make his own.

Grind either sugar of lead or sulphate of zinc (white vitriol) in raw linseed oil, or equal quantities of both together. One teaspoonful will dry from twenty to twenty-five pounds of color. This dryer will not injure the most delicate color, even the purest white.

DRYING JAPAN.

This dryer, if of a proper quality and light in color, a teaspoonful will dry from twenty-five to thirty pounds of color.

SMALTS.

Smalts of various colors are required, and I would here state, upon my own experience, that they can be purchased better and cheaper than they can be manufactured. I would advise all painters to purchase at any respectable color store, where their own experience has given them confidence.

A few more necessaries are required, such as a slab and muller of white marble, a pallet knife, pots, paint-brushes, etc., etc. Let the brushes range in No.'s from 2 to 300. Also a few tools, commonly called sash-tools, from No. 4 to 8. Flat French tools, various sizes; a few round tools, bound in tin; also a stock of sable tools, short, medium, and long, to suit all subjects that may occur.

Camel-hair tools and pencils are also good, and generally lay the color finer than sable. A bench is also required; an easel; a set of pallets, of hard wood or ivory; a mall stick (a small slender rod of firm wood, with a ball of cotton at one end covered with chamois skin), to support the right hand. Some artists discard the mall stick altogether, as it hinders a perfect freedom of the pencil, but it is best for beginners, or any one slightly nervous.

A rinsing cup is also necessary; a small tin cup, made to hold about a gill. Have a small cup made to fit into the large one—about one-third as deep—perforated on the bottom with small holes; fill the large cup with turpentine until it reaches over the perforated bottom of the inner cup; rinse the pencils in this, and the refuse color from them will settle to the bottom of the large cup, leaving the turpentine always clear. They should afterward be washed in soap and water.

Having advanced thus far, lay in a small stock of oil, turpentine, japan, etc., etc., a small keg of the best English white lead ("B. B." brand) and then select a suitable board for a sign, and commence

FIRST OPERATIONS.

There are various theories respecting the quality of wood to be used, as also in relation to the particular "cut" of the log. Some contend that the center cut is less liable to warp and "shake," owing to the grain running squarely through. It must be acknowledged that this theory has philosophy in it, and, from my own experience, I admit that it is a good board. But the outside of a log is best, for two reasons, viz.:

In the first place, the outside cut has been more exposed and consequently more thoroughly seasoned. Second, the grain runs through more upon an angle, and, therefore, not so liable to split, shake, or warp.

You must provide yourself with a can of shellac varnish, which is simply shellac dissolved in alcohol, and reduced to a proper consistency to spread easy. The use it is most often put to is covering knots and sappy places that may show after the first coat of grounding.

Another and a better way to use it is, to give the whole board a flowing coat of it, thus making the whole surface equal, and kills any resinous spots, discolorations, etc. The best way to serve knots, however, is to bore them out entirely with a center-bit, boring a trifle outside of the knot, and an eighth of an inch or so in depth. This being stopped with stiff putty, effectually disposes of all trouble arising from knots.

It is a good idea to have a little "stout" shellac on purpose for small knots, as before-mentioned, for in many instances it will completely obliterate them. Make your own shellac, if possible, as it can be more relied upon than the most that is in the market, being generally adulterated with soft gum. It not unfrequently occurs that the turpentine and oil mixes with such shellac, after dissolving it (provided it is not good), but if you make it of shellac alone you may depend upon its quality.

When your shellac is dry mix up as much white lead as you require, beating it up in oil, stiff; then add your dryers, in about the same proportions as already given; then add a little turpentine, just enough to reduce it to the proper thickness; then give your sign-board a good, even, full coat.

When this is dry rub it down with pumice-stone, so that the surface will be perfectly even and free from all plane-marks. Avoid sand-paper, for it never cuts down a surface so well as pumice-stone, although it will do for ordinary work. Then putty up all holes, etc., with good, stiff putty (common putty and white lead mixed, is good).

The second coat may be similar to the first, only let there be less oil in it. The third coat must contain still less oil; say one-third oil and two-thirds turpentine. The fourth, or last coat, must contain very little oil; dry with drying japan.

I have found by years of experience and observation that too much oil is the cause of the blistering and scaling so frequently seen upon sign-boards. The fact is very patent, for, as in coach painting, the more oil used the more contraction and expansion; and, consequently, no other method of mixture will stand all exposures, summer, winter, sunshine, and rain, so well as the one I have given.

As we now proceed to consider the most suitable colors and tints for the various grounds, etc., it will be necessary to enter into the philosophy of *contrasts* and *harmonies*, *force of color*, so as to be able to select proper colors for the work that is to follow.

Contrast in its first element may be called black and white, and this is confined to light and shadow and the disposition of lines. Though both are necessary in works of color, I will take it for granted that you understand them already, and so pass at once to contrast of colors which give the principal charm to painting.

As the present object is to avoid dullness we shall strive to obtain the opposite—brightness, and err, if at all, on the credit side, leaving mellowness of tone to follow as a natural result of an educated eye.

Force or power does not consist in strong and gay colors, but is entirely the result of proper combinations and contrasts. Two contrasting tones must be brought together and then the power of each will be felt.

Thus, if our grounds are warm and yellow tints, we should have blues and purples in contrast.

If our grounds are cool, then reds and yellows are a fine contrast. The three principal contrasts are *blue* opposite

to *orange*, *red* to *green*, *yellow* to *purple*, and by carrying out this principle of opposition of color throughout the scale, you will obtain an endless variety of contrasts.

Remember this, a color and its opposite naturally increase as they approach, but when once they mingle, they destroy and neutralize each other. To give a shadow to a letter, the student must be cautioned not to use merely a darker shade of color, either of the letter or of the ground, for that would only result in a tame, dull effect. Many carry this principle into sign painting, and thus lose the advantage of contrast that an opposite color would give.

The shadow is to represent a certain modification of atmospheric effect, and will, in almost every instance, partake of a natural tone or harmony of contrast.

For instance, let a small block of wood be placed upon a sign; paint the block the color you want for your letters place it so as to throw a shadow either to the right or the left, from the sun, and observe the particular tint of the shadow so cast. You will observe a *compound* effect or tone, proceeding both from the block and from the sign, a natural blending of the two. This gives you a true contrast always in harmony.

Contrasts in great variety can also be had upon the principle of force of color, but there must be a distance left between the letter and the shadow, to relieve it, otherwise the strong contrasts would appear harsh and hard. Always bear in mind that a sign is not like a picture, to be examined at short distances, but generally from fourteen to forty and fifty feet from the eye; consequently the colors used must possess sufficient force (although in harmony) to have effect at such a distance.

The same idea is the point to be gained in scenic representations and a study of effect and force of color, as seen in stage scenery, is a good one for either student or professor.

As a general thing you will find that the reds require a shadow of a purplish or dull brown; in some cases, where the ground admits of it, almost positive black.

And in yellows, of the umber shade, you will require a gradation of golden hues for your first shade, ranging down to nearly black.

RULES FOR CONTRASTS.

Positive and sweet contrasts, such as the following, may be taken as a general idea:

Light pink upon a white ground can be best shadowed by a warm brown.

Light grays and drab grays shadow with rich browns.

For greens, reddish brown shadow.

White to flesh-color, rich purple shadows.

As a standard rule, warm shadows to cool, light colors; and cool shadows to colors of a warm tint.

Avoid the use of greenish blues and greenish yellows; they both appear unsatisfactory and sickly.

Blue and yellow both become agreeable as they incline to red. Red becomes rich as it inclines to blue, and brilliant as it inclines to yellow.

A shade of purple and orange are agreeable, but no greens except those that incline to yellow.

All tertiary tints, such as citron, olive, russet, etc., are agreeable, and have value by contrast of their own shades.

HARMONY.

It may be as well, before leaving the subject of contrasts, to point out how far harmony affects the sign painter, although its principal use has reference to the finished work.

Harmony is the art of uniting two extremes of light and shadow, or of warm and cool colors, by the introduction of such intermediate tones as will subdue the crudeness of effect, caused by the use of opposites alone. By introducing *half tints* which partially unite the dark masses of color, when placed between them, their relation to each other becomes toned down, and in a measure deprived of this rudeness.

Thus the primary colors, red, yellow, and blue, are opposed or in contrast to the secondaries, green, purple, and orange, when standing together, but become united and harmonized by the friendly introduction of a neutral, placed between them.

This is the case with the compound tints, however far

removed from the primary colors, the qualities of color being always brought out by harmonious opposition.

Harmony, then, consists in using such materials between these colors or tones that are opposed as may diminish the violence of the contrast, and conceal the aim of the painter in bringing them together. If this is not done, the attempt and not the deed will confound not only the painter but the reader of his sign.

Harmony, then, is simply that expedient which the force of contrasts compels us to adopt, and is useful to this extent—that by it we secure that force without which our work would be either too tame or too harsh. It is really the golden link in composition.

In describing the mixtures of colors and tints, all that is necessary is to exercise due caution in applying them to your lead or zinc that you have beat up in oil, being careful not to mix too thin, for by so doing you will find it a difficult matter to bring your color to a true assimilation.

As some colors are light and others heavy, you will see the necessity of keeping your color stiff; and always thin your tinting-colors; and always put in the color which is to predominate, or give the general tone, first, and until you see that you have enough, then add the others, if any, to the mixture until you have obtained the required shade.

TABLE OF TINTS.

GRAY.—White and lamp black.
BUFF.—White, red, yellow, and a little black.
PEARL.—White, ultramarine blue, and carmine.
ORANGE.—Yellow and red.
VIOLET.—White, ultramarine blue, and carmine.
PURPLE.—Same as above, only in different quantities.
GOLD.—White, stone ochre, and a little burnt umber.
OLIVE.—White, yellow, black, and red.
CHESTNUT.—Red, black and yellow.
FLESH.—Vermilion, white, and yellow.
FAWN.—White, red, yellow, burnt umber.
DRAB.—White, yellow, red, burnt and raw umber.
Do. —Ochre, burnt sienna, black.
Do. —Any variety can be obtained by these colors.

BROWN GREEN.—Chrome green, yellow, black, and red.

PEA GREEN.—Chrome green with white lead.

ROSE TINT.—Carmine and white, or madder lake and white.

COPPER.—Red, chrome, yellow, and black.

LEMON.—Pale chrome and white.

CLARET.—Vermilion and blue.

DOVE COLOR.—White, vermilion, blue, yellow.

PINKS.—White, vermilion, madder lake or carmine.

CREAM.—White and pale yellow ochre.

SALMON.—White, light red, and yellow.

STRAW.—Chrome or yellow ochre and white.

LILAC.—Carmine, blue, and white.

These constitute the principal tints in general use, but by practice in composition, a great variety more can be obtained.

Having proceeded thus far let us now turn our attention to

LETTERS,

their proportion, etc., and take as an alphabet the most beautiful one the world ever knew—the Roman.

The Roman Italics differ from the capitals only by being slightly inclined from a perpendicular, and this inclination should not vary much from an angle of sixty degrees, although natural taste has much to do with governing it.

The letter A is generally formed with more faults than any other in the alphabet, and in nine cases out of ten it is occasioned by spreading its angles too much. It should not be wider than H or N, hair lines included.

The upper part of B, E, F, and R should take up a particle less space on the main line of each letter than the lower part, and the upper, horizontal projecting curve of B and R should in the same proportion be a trifle the smallest.

The connecting bar of the letter H should be a trifle above the center of the letter.

The perpendicular width of the curve for P should take up just half the length of the main limb of that letter.

The bottom curve of J is allowed a handsome sweep, so

that the projecting horizontal line at its top and its curve will occupy the same space as C or S.

The upper curve of S should be smaller than the lower curve, and for this reason—the bottom of all letters should as near as possible form the base of their apparent structure.

The middle top line of W is dispensed with, and that center limb terminates in a peak or point.

To form a curve to the last of R is preferable to a flat, straight termination, provided the curve be made full, and the letter seems to stand firm.

The last limb of G should terminate at seven-sixteenths of its hight, or a little less than half its hight.

Eight letters, B, D, E, G, O, P, Q, and T, will occupy the same space from left to right as they do in hight.

Six letters, C, F, J, L, S, and Z, will take one-sixteenth less width than hight.

M and W, one-sixteenth more width than hight.

I, one-half its hight wide.

If two lines are drawn upon a sign or sheet of paper, say half an inch apart, and eight compartments set off, half an inch square, B, D, E, G, O, P, Q, and T, each will fill one square and be well-proportioned letters.

Then divide off six compartments, one-sixteenth part narrower than they are high, for C, F, J, L, S, and Z.

Then make nine compartments, one-sixteenth wider than they are high, for A, H, K, N, R, U, V, X, and Y.

For M and W, allow one-sixteenth more width than hight; for I, one-half its hight; for &, one-eighth more width than hight.

These proportions will form a very graceful letter, but they can be either compressed or extended from this rule so as to suit both taste and space.

The small letters are more difficult to form than the large ones. The main body of thirteen letters, viz., a, b, d, g, h, r, n, p, q, u, v, x, and y, will occupy a square each.

The letters c, e, o, r, s, t, and y, require one-sixteenth less width than hight; i and l, one half their hight in width.

These relative proportions are given without the projecting limbs above and below their main body, which pro-

jections should be one-half the hight of the main body of the letter.

The proportions for *Italics* are as follows:

Seven capitals, C, G, J, E, O, Q, and S, occupy a square.

Sixteen letters, A, B, D, E, F, H, X, N, P, R, T, U, V, Y, Z, require one-sixteenth more width than hight; M, three-sixteenths wider than high; W, two-sixteenths wider than high; and I, one-sixteenth less; with a given angle of from sixty to sixty-three degrees.

In the small alphabet, seven letters, viz., a, i, k, r, s, t, v, will occupy a square each, subject to the same rule regarding their projecting parts as given for the others, the small Roman letters.

Thirteen letters, b, d, f, g, h, j, n, p, q, u, x, y, z, will occupy one-quarter more width than hight; m, two-fifths more width than hight.

It may be observed here that the block-letter alphabet is of about the same proportion of hight and width as the Roman capitals do, except in extra full lettering, for which proportions the additional thickness of the body of the letter must be added to the rules given in relation to the Roman.

All these letters are only varieties of those given above, and are left to the taste of the painter. Practice, with the rules already given, will unfold much that cannot be written, and much that can only be attained by experience.

Practice what has thus far been given, and then we will go one degree higher, to the consideration of

GILDING.

Before considering this branch of the sign-painter's art it will be best to treat upon the various sizes in general use among them. And here I wish to guard the uninitiated against the use of gold size, sold at most of the color stores. They are generally got up from recipes published by men who are totally ignorant of the nature and properties of a permanent gilding size. My own experience amply confirms this assertion.

Let every painter make his own size, and then he will be less likely to be a stranger to what he wants. If it be too

slow in drying, or if it dries too quickly, he will be able to know what is required to make it right.

An excellent size is made by putting boiled oil in a good stone pot; place it upon a slow fire, and let it rise to such a heat as nearly to ignite; then with a match or a bit of lighted paper set fire to it, and let it burn for a few minutes, so as to thicken; then take a piece of cloth and cover the pot, to put out the flame, and it will then be like syrup or thin tar.

This done, strain it through a silk stocking or handkerchief into a bottle and keep it closely corked. When you wish to use it, thin it with turpentine, but [illegible] reful and not use it too thin.

ANOTHER RECIPE.

Another good size for gilding may be made in this way: Procure some pure old drying oil, the older the better; grind into it some ochre and a little of the best quality of red lead; then thin it to a proper consistency; form your letters carefully, laying it very even and thin, and let your work stand until so dry as only to have sufficient "tack" to hold your leaf. Apply the leaf with a gilder's tip carefully and lay it smooth with a flat camel-hair brush or a ball of fine cotton wool, but do not brush off all the superfluous gold until you are sure that the under size is perfectly dry and hard. This gives the gold its full brilliancy and stands the weather well.

QUICK DRYING SIZE.

Take a little good, quick-drying copal varnish; add to it a small quantity of your old boiled drying oil, just enough to give it "tack," and when dry enough lay your leaf as before directed.

A SIZE KNOWN TO BUT FEW.

Take one pound of good, pure drying oil; put it in a metal pot with a cover; slowly add to this, after it has come almost to a boiling point, four ounces of pure gum animi (not copal; gum dealers are of the opinion generally

that animi and copal are one and the same, but such is not the case). Have your animi reduced to a fine powder; take it upon the point of your pallet-knife and put it in cautiously, little by little, until you have it all in, allowing time to dissolve, and all the while keep stirring the mixture. Boil to the consistency of tar, and while warm strain it through a piece of silk into a heated, wide-mouthed bottle; keep well corked, and when required, thin with turpentine and mix thoroughly. If you grind a little vermilion with this size it will show you what you are doing when using it.

This size will gild on glass, china, metal, signs, and nearly everything, and if properly made has no equal; being more durable, it gives more luster to the gold than any other size, and has the very singular property of retaining the "tack" longer than any size known.

This is the "secret size," used by the best artists in London and Paris, and the one used by the justly celebrated japanners of Birmingham, who produce the finest work in decoration to be found in the world's market.

The artist must be furnished with a gilder's cushion, with parchment back and ends; a knife to cut his gold; a "tip," or brush, to lift his leaf with; a ball of cotton wool, and a flat camel-hair brush to clean off with.

Take a little clean tallow on the back of the left hand, and then draw the "tip" quietly over the tallow and it will receive enough to take up the gold. Then place it lightly upon the work, to which it will adhere readily, and so continue until all your sized work has been covered with it.

The next thing to do is to pad it down lightly with your cotton ball, being careful to omit no portion of it, for if a mistake occurs on the first going over, you will find it very difficult to mend it afterward. So be particular in your work and miss no part of it. As before stated, do not thoroughly brush off your work until entirely dry.

Always, when gilding, try your size upon a piece of painted board or glass, in order to determine accurately the length of time it requires to dry. If it dries too quick, add some oil. If you size to-day and gild to-morrow, and should you find the size too dry in the morning, you will have to add a little old, fat, raw linseed oil, as this tempers

it so that you can set your own time for the gilding. A few experiments in this connection will enable you to master and regulate the nature and operation of size

FOR A SIZE EXPOSED TO THE WEATHER.

One thing has been proved by experience, that is, that no gilding exposed to the extremes of summer and winter, wet and dry, cloud and sunshine, *should ever be varnished.*

The bare gold, if good, and on good size, will stand better, change less, retain its luster longer, with less liability to "dulce," or crack, than when varnished, although done with the best copal varnish ever made.

I have seen a sign done with gold, upon a black ground, that had stood the weather *forty years!* The board had given way to the effects of the weather, and had fallen away in many places, leaving the letters standing out bold in good form and well preserved. So much for good size and *no* varnish.

DRYING OILS.

It may not be out of place to give, at this point, a few formulas for preparing drying oils, as many of the oils sold at the stores are of a spurious character, totally unfit for the development of good work.

A fine, pale drying oil can be made as follows: Take eight pounds of linseed oil, one ounce of calcined white lead, one ounce of yellow acetate of lead (also calcined slightly), one ounce of sulphate of zinc (white vitriol), twelve ounces of vitrious oxide of lead (litharge), and one head of garlic. When the dry substances are pulverized mix them with the garlic and oil over a fire hot enough to keep the garlic and oil in a state of ebullition; continue the process until the oil ceases to throw off scum, and until it assumes a reddish color and the head of garlic becomes brown.

A pellicle will then be formed upon the surface of the mixture, which indicates that the operation is completed.

Take the vessel from the fire, and the pellicle being precipitated by rest, will carry with it all the parts which rendered the oil fat. When the oil has become clear, separate

it from the deposit and place in wide-mouthed bottles, where it will completely clarify itself in a short time and improve in quality.

The oil will be lighter in color if the dryers are put into a bag and suspended by a cord fastened to a stick laid across the mouth of the bottle; but you must use more dryers if you wish to adopt this method; in other respects operate as described.

To manufacture drying oil without heat: When linseed oil is carefully agitated with white vinegar of lead (tribasic acetate of lead) and the mixture allowed to clear by settling, a copious, white, cloudy precipitate forms containing oxide of lead, while the oil is converted into a drying oil of a pale straw color, which makes an excellent strong drying oil or varnish, which ought to dry in about twenty-four hours. It contains from four to five per cent. of oxide of lead in solution.

THE BEST PROCESS.

The following proportions appear to be the most advantageous for a preparation of drying oil:

In a bottle containing four and a half pints of rain water put eighteen ounces of neutral acetate of lead, and when the solution is complete put in eighteen ounces of litharge, in a very fine powder. The whole is then allowed to stand in a moderately warm place, frequently agitating it to assist the solution. This preparation may be considered complete when no more small scales of the litharge are apparent.

The deposit of a shining white color (sex basic acetate of lead) may be separated by filtration. This conversion of a neutral acetate of lead into vinegar of lead, by means of litharge and water is effected in about a quarter of an hour, if the mixture be heated to ebullition. When heat is not applied the process will take from three to four days. The solution of vinegar of lead thus formed is sufficient for the preparation of twenty-two pounds or three gallons of drying oil.

For this purpose the solution is diluted with an equal amount of rain water, and to it is gradually added, with casual agitation, twenty-two pounds of oil, with which eighteen ounces of litharge have been previously mixed.

When the points of contact between the lead solution and the oil have been frequently renewed by agitation of the mixture (three or four times per day), and the mixture is allowed to settle in a warm place, a limpid, straw-colored oil rises to the surface, leaving a copious white deposit.

The watery solution, rendered clear by filtration, contains intact all the acetate of lead originally employed, and which may be used in the next operation, after the addition to it as before, of eighteen ounces of litharge. By filtration through paper or cotton, the oil may be obtained as limpid as water, and it can also be bleached by exposure in the sun.

If this oil requires to be absolutely free from lead, it may be so rendered by the addition of dilute sulphuric acid to the above, when, on being allowed to stand, a deposit of sulphate of lead will take place, and the clear oil may be obtained, free from all traces of lead.

ZINC DRYER.

This dryer is prepared from the oxide of manganese and raw linseed oil.

The manganese is broken into pieces as small as peas, dried, and the powder separated by a sieve. The fragments are then placed in a bag made of iron wire gauze—this to hang in the oil contained in the iron or copper vessel—and the whole heated gently for twenty-four or thirty-six hours.

The oil, however, must not be allowed to boil, for there is great danger of its running over. When the oil has acquired a reddish color it is to be poured into an appropriate vessel to clear.

For one hundred parts of oil, ten parts of manganese may be employed, and which will serve for several operations when freshly broken and the dust separated.

Experience has shown that when fresh oxide of manganese is employed, it is better to introduce it into the oil on the second day. The process occupies a longer time with the fresh oxide. Very great care is required to prevent accident, and one of the principal points to be observed is that the oil be not overheated. If the boiling should render the

oil too thick, this may be remedied by an addition of turpentine, after it has thoroughly cooled.

COLD-MADE DRYING OIL FOR ORDINARY PURPOSES.

Four ounces of litharge to the gallon. Stir it often, and allow it to settle. Pour off carefully, and you have a good, clear, drying oil.

Any of the drying oils described will work and stand well, if you use sufficient turpentine in the mixing, and you will thereby be able to dispense with raw oil and japan dryers. If you wish to hurry up your work a little drying japan can be used.

GILDING ON GLASS.

This beautiful art is worked in many different ways, every artist having his own peculiar method.

One very good way is to first outline with a piece of hard soap, your letters, scrolls, etc., (on the outside) then commence to outline on the glass (inside) with some suitable color, a light shade line for the top and left side of the letter; then upon the bottom and right side of them use a black, or, in fact, almost any color you may select. When dry proceed to lay on your gold.

Some use gin, some whisky, others simply water; gum arabic in solution, white of egg, may be used. One can merely breathe upon the glass and it will sometimes answer the purpose of a "tack" for the gold.

I have found an excellent size, made from a solution of gum tragacanth in water. The first part that dissolves is the part that suits best; that portion being pure, while the residue is cloudy and unfit for use.

When wanted to use, reduce a portion of the gum with water to a very weak standard, as in all cases you will find your gilding bright in exact ratio to the thinness and transparency of your size. I consider this the most desirable size, especially for large work.

OUTLINING UPON GLASS.

First Method.—Draw your lines upon the glass at the proper distances for the size of your letters, etc., with a piece of hard soap, which will make very distinct lines. Then form your letters accurately, and in true distances or space, one from the other, being satisfied that all your proportions, etc., are correct. You will now be ready to commence your gilding.

Second Method.—Have your letters, etc., drawn out on fine paper; prick with a pin the outlines of your letters, scrolls, etc. Next take a bag made of muslin, filled with fine powdered charcoal; lay the paper carefully to its proper place; then pounce the charcoal bag against the paper, and you can then trace the outlines in full with black japan. To make all secure it will be necessary to give the work two or three coats, and when dry, wash or rub off all superfluities with a sponge or soft cotton rag.

N. B.—This method is only used after gilding, where the leaf is placed full without any outline.

Third Method.—To get accurate lines upon glass, preparatory to gilding. In the first place, clean the glass thoroughly; then with a mixture of whiting, water, and a little milk, brush carefully all over the outside of the glass. When dry, draw your parallel lines, letters, scrolls, etc., with a pointed stick.

For small work, turn the glass around, and letter backward. If inside of a window, work upon the same principle. This is an easy and a true method of forming your lettering or ornamentation, as any fault in the drawing can be easily corrected.

MODUS OPERANDI FOR GILDING ON GLASS.

Whichever size you agree upon, lay it on with a full pencil, and proceed with your gold at once, so as to secure a solid "cover" without being obliged to "touch up," and if you wish to use two coats of gold, blow your breath upon the first coat to hold the second.

Lay as much gold as possible before your size dries, and so proceed until your lines are finished. Then rub it down

gently to remove the superfluous gold. Then proceed to outline as in second method above; or draw your parallel lines through the gilding (if in capitals of one given length) and cut in your letters with black japan very carefully, forming them all backward. This is the principle of the first method, but it requires considerable practice to do it correctly.

If any ornament is wanted in the body of the letters, lay them in with oil size. When dry, gild and shade if required. When all is dry, lay in the entire letter with the size (spirit or water size) and gild and back, as above, viz.: with two or three coats of black japan.

The shading is done afterward, and in any colors the artist may decide upon. It generally takes two coats to cover solid upon glass.

Gilding upon glass requires great practice and very nice handling, but with proper care, this process looks very beautiful and stands well.

Silver leaf is laid on in the same manner, only it requires a little stronger size than the gold calls for. The silver being heavier relatively, use the size of gum tragacanth.

One point seems rather difficult—that of having to form the letters backward, but practice is the only thing that will make perfect in this respect, and enough of it will make, what at first seems a difficulty, as easy as the formation of letters in the ordinary way.

CHANGEABLE SIGNS.

Have a board made of any convenient size, and have a projecting band or molding around it. Then cut into the band grooves the thickness of a handsaw, an inch apart, allowing each cut to reach to the bottom of the band. In each of these slots insert strips of tin, just wide enough to fill the entire slot, and long enough to reach entirely across the sign board.

When all fitted, take them out and place them edge to edge upon a flat surface, and paint any word you like upon their combined surface. When dry, reverse and paint other words upon the other side.

Next paint any words you please upon the surface of the

sign board, and, when dry, again insert the strips of tin into the slots in the board, taking them up in the same order in which they lay when painted upon.

This is really a magical sign (three signs, in fact), and changes as the observer changes his position, at one angle showing one thing, and at another quite a different one. They are coming much in use now-a-days, and it is a good branch of the art to make one's self perfect in.

JAPANNED TIN SIGNS.

Draw your letters on paper to suit your sheet of tin, having first cleaned it with diluted alcohol and a piece of cotton. This will remove any grease or other matter that might hold the gold. Then take some whiting and rub it over the back of the paper upon which your design is made and lay it upon the japanned tin.

Place a weight upon the four corners of the paper, or otherwise fix it securely to the tin; then, with a fine pointed piece of hard wood, trace the design carefully, bearing upon the paper with the point just hard enough to cause the whiting on the under side of the paper to adhere to the tin, and after going carefully over the whole, you will have transferred the entire design in fine white outline to the tin you are to finish it upon.

Then size with either quick or slow drying oil size, and, when sufficiently dry for gilding, lay on the gold leaf, and "bat" it down thoroughly, afterward brushing off with your flat camel-hair brush or cotton.

REMARKS ON SHADING.

There is a difference between shading and shadows. Shading a letter is simply making an artificial representation of a raised letter, and consequently requires a light fine shade upon the top and left side of the letter, and a dark one upon the bottom and right side.

These shades will have the effect of raising the letter, but the deception is incomplete without the shadow. This is to be attained by representing a shadow cast by the painted object, and should always be of one uniform color: dark, but very thin. A mere glaze, as it were, composed

of ivory black, Vandyke brown, raw and burnt umber, asphaltum, etc.

Always keep in view the tone of the ground, for that has all to do with choosing the most natural shadow, as stated before. The above enumerated colors, by judicious and well balanced composition, will yield an excellent shadow to suit any ground.

In shading letters, considerable judgment is necessary, as some of the alphabet requires less shade than others, for this reason: a portion of them would be filled up too much if the shade was of uniform weight. B, S, K, G, and N, the body angles of which do not admit of so heavy a shade as perpendicular or bottom letters.

It is very general with sign painters to make the bottom shades a trifle heavier than the perpendiculars, and for this reason: the sun casts a heavier shade to the bottom in proportion to the angle of light, and for this reason a heavier shade is demanded.

In regard to the formation of letters, one rule will hold good in all respects, at least so far as Roman letters are concerned; in case you do not wish to paint them square—as wide as they are high—diminish the width in exact ratio to the increase of the hight, and *vice versa*.

PAINTING ON CLOTH OR SILK.

For Masonic or Oddfellow's aprons, banners, or any work of like nature, a few words may be useful.

First have your material put upon a stretcher, and then complete your lettering and design. Prepare a size as follows: Dissolve bleached shellac in alcohol, and thin as much as will cover the parts to be painted or gilded, using the precaution to cut over the outline a little, so as to prevent the color from spreading.

Another size may be prepared by simply using the white of an egg. This size will do where the work is not exposed to the weather, or when it is required to be done quickly; and for such work, where gilding is to be done, lay the gold while the size is wet, and when dry, dust off the surplus gold and proceed with the painting, shading, etc., when you are sure that the size is dry, remember.

SIZE FOR BRONZING.

A good size for bronzing, or pale gilding, is a mixture of asphaltum, drying oil, and spirits of turpentine.

A size for gilding on cloth, silk, plaster, etc., is made as follows: Take a little honey, combined with thick glue. When reduced properly, this size has the effect of brightening the color of the gold leaf, sticking to it well and giving it a very fine luster.

VARNISHES FOR SIGN WORK

The artist has already been cautioned against the use of varnish for gilt signs; but there can be no doubt that the varnish not only improves, but is actually necessary upon a sign where the decorative or ornamental style is introduced. Varnish has the effect of bringing out the force of colors; brings them to their true tone, and gives the artist an opportunity to be judged on his merits, relative to harmony, contrast, and force.

For this reason, considerable care must be taken in selecting a suitable, durable varnish for this purpose.

An excellent varnish for sign painters may be made as follows: To eight pounds of best African copal, add two gallons of pure, clarified, drying linseed oil, half a pound of sugar of lead (acetate), three and a half gallons of turpentine.

Boil the copal in the oil very slowly, for from four to five hours, until quite stringy; then allow it to cool to about 130 degrees F.; afterward add three and a half gallons of turpentine at the same temperature. Mix well, and strain into cistern or tank. This makes a slow-drying elastic varnish, not liable to crack by any out-door exposure.

QUICK DRYING VARNISH.

"Japanner's gold size," or quick drying varnish, may be made in this manner:

Eight pounds gum animi, half a pound dried sugar of lead, two gallons of clarified drying oil, three and a half gallons of turpentine.

Boil for four hours, strain, etc., as above.

Use one pot of this varnish to two of the former kind, the slow drying. This mixture will dry in about four hours in summer and six in winter.

This quick drying varnish makes a good dryer for delicate colors; about a dessert-spoonful to twenty-five pounds of color being a fair proportion.

Should the artist not wish to manufacture his own varnish, let him avoid buying any cheap article, but inquire for "slow drying, body copal varnish," and also for the best drying japan, so that if required to varnish a piece of work that is wanted to dry quick, he can do so by adding a little of the japan.

MISCELLANEOUS RECEIPTS.

To Clean Old Sign Boards.—Brush over the face of the board with warm alcohol, and repeat two or three times if necessary, after which the "smalt will come off easily, by the use of a dull chisel or an old plane-iron. Care should be taken not to cut into the surface, as such places are hard to patch up again.

Another Method.—Take three and a half pounds of stone lime, two pounds pearl-ash, two ounces soft soap, three ounces of ammonia. Slack the lime, then add the soft soap. It may require a little water to form a paste; then add the pearl-ash and the liquor of ammonia. Keep in a close-stopped, wide-mouthed bottle, or stone jar, with a little water, like paint. This mixture, when laid on a sign or any old piece of painting, will soften it so that it will wash off with the utmost ease.

Still Another Method.—Lay your work top up, and go over it with turpentine; set fire to it, and the old paint will soften up, and with an old chisel or a piece of flat, sharpened wood you can scrape off the old color with perfect ease. The best way of doing this is to cover a foot or so at a time with the turpentine, and proceed as above. Then rub off with pumice and water.

TO LAY SMALT GROUNDS.

Mix your color as near as possible to the desired shade to suit the smalt; mix with strong drying oil, not too thin; then cut round your letters, scrolls, etc.; with a fitch and sash tool fill in all the spaces; then with smalt dust all the surface, taking care to put more than enough on, so as to allow the "oil ground" to absorb all it possibly can. When dry (usually the next day) turn your signs on end, or on the side, and all the surplus smalt can be brushed off and saved. A small wire sieve is good for straining smalts.

Some printers shade their letters first, that is, before smalting, which is the neatest way for fine or small work; but for large signs it will have a better effect to shade the letters after smalting. Mix the shading color with very little oil, mostly japan and turpentine, and draw with short quill tools or French fitches.

FLOCKS.

Flocks are laid upon the same principle. These grounds are very beautiful and chaste looking, but they are very unsuitable for signs that are exposed to the weather, as the colors do not stand any length of time, black being the only one that can be depended on.

Instead of smalts, colored sands are sometimes used. These retain their colors well, and if taste is displayed in arranging the hue and tints, very beautiful work can be produced.

FACING PUTTY FOR SIGNS.

Facing putty for signs that are to be gilded may be made in this way: Take a little fine whiting, a very little drying oil, japan dryers, and beat all up to a reasonable stiffness. With this mend all the inequalities with a square-ended knife. This putty will harden very rapidly and dries without any shrinkage, tack, or softness. In mixing, use more japan than oil, say two-thirds japan.

GLASS SIGNS, WITH PEARL SETTINGS.

The best method of doing such signs is, first to draw your parallel lines with a sharp pointed piece of hard soap. Then form your letters correctly, giving them the proper distances, etc.

Have your outlining very true, as by so doing you will avoid much trouble when finishing. If you desire to enclose the pearl within gold lines, clean your glass upon the opposite side, then with your camel-hair brush lay on your size as directed for gilding on glass.

When you have done this, lift your gold leaf and lay it on carefully. When all the gilding is done and dry, take a pencil of the proper size and cut in all the letters as neat as possible, giving them sufficient strength and weight in proportion to the size of the letter, leaving the center or blank space entirely clear.

By "cutting in" I mean that all you wish to show in gold must be laid in with black japan, two coats. When the japan is dry, then wash off carefully all the surplus gold. The work is now ready for the pearls.

The pearl for this work is all prepared, ready for use, in thin pieces or sheets. There are two kinds, the *snail*, and the *aurora*, also the small broken pieces, called *scrap*, which is very useful in filling up small portions of the work, and forming different kinds of ornaments.

If careful in selecting the snail pearl, great beauty and order may be obtained, for shells of an equal size and form when cut into sheets will reflect either concave or convex, according to the side presented to the eye.

If a round piece is wanted in the center of each body and round turn of the letter, cut the sheet with a sharp pair of scissors into the desired shape. It is the best way to make a pattern of tin to cut them by, thus insuring a perfect uniformity.

Then clean off the edges with a fine file, and arrange them upon your table so as to have them reflect all one way, convex side up. Have your size in a little cup, a short, stiff, sable pencil, etc., ready to work.

Lay a coat of size over the face of the pearl and then put it in its proper place in the letter. Press it hard upon

the glass so as to displace all the size possible, as much of the beauty of the work depends upon having as little as may be of the size show between the pearl and the glass. As with glue and wood, the less glue there is in a joint the better it holds, and the closer the pieces of wood approach each other.

When you have set all of the pearls turn the glass face upward, and see if all are placed so as to show alike, for if there are any corrections to be made now is the time to make them.

There are a great variety of forms manufactured and for sale, such as representations of humming-birds, paroquets, fish flowers, scrolls, etc., which are susceptible of being made into very pretty work when judiciously handled. In short a thousand varieties of work can be produced and many different materials used in this same way.

After the larger pearls are set you can form the other portions of your letters with such sizes as you may choose, and fill up the smaller portions with the "scrap," taking care, however, not to have the pieces set too near together, or the effect will be bad, as much relief is obtained through the medium of the ground.

When your size is dry and the pearl firm, then have your ground mixed up stiff with drying japan, oil, and turpentine, but only a small proportion of oil. After mixing it to the proper shade lay on a heavy coat of ground color.

When any particular style of ornamentation is desired you can vary the colors of your ground, shading the different sides of the letters, scrolls, etc., to suit your own taste and fancy, doing the shading in a similar way as you would any glass signs.

Green, red, yellow, white, etc., are used with good effect, shaded in order, viz.: greens with darker greens; reds with brown, purple, etc.; yellow with burnt umber, blending carefully. In short, a great variety of colors may be used in such work, and, as before said, an endless variety of styles produced.

SIZE TO FIX THE PEARL.

1st. Pure mastic varnish.

2d. Pale, quick drying copal varnish.

3d. Copal varnish and Canada balsam : one-third copal : two-thirds Canada balsam.

In shading letters, they look best when the shade is drawn on an angle of about forty degrees, although much depends upon the taste of the artist.

With the simple rules here given for pearl and fancy signs, every variety known in the market may be produced.

CONCLUDING REMARKS.

Having gone over about all that is necessary to constitute a ready "Hand Book" to the sign painter, a few concluding remarks may not be inappropriate. I do not presume to teach the practical sign painter or gilder, still I flatter myself that even he may find in this Manual many things that are new or but imperfectly understood.

These recipes and methods—in fact, the contents of the entire book—is but the summary of a long experience on my part, both in this country and in England. I have given nothing and advanced nothing but what I have used and profited by myself.

Still experience is not the only help a man may employ. The experience of others oftentimes saves us from much labor in personal research and experiment, and what I have read, what I have learned myself during forty years of practical sign and decorative painting, is here given freely for the good of the profession.

SCALE OF PRICES.

Letters are generally charged for by the foot.

Plain letters - - - - -	30c.	per foot.
For one shade, add - -	10c.	"
Double shade, add - - -	20c.	"
Gold letters - - - - -	$1.00	"

Ornamented letters, scrolls, etc., charge for time and material in the same proportion

Japanned tin signs - - -	7c.	per inch.
Shading " - - -	2c.	"
Lettering on glass - - - -	7c.	"
Letters made on glass, tin, or stone	3c.	"
Plain ornaments, same as letters.		
Gold borders - - - - -	3c.	"

In gold or plain surfaces, the labor equal to cost of the gold.

Ornaments in proportion to the labor.

These rules will serve as an average in proportioning the prices to the amount of labor.

It would be superfluous to enumerate a further list of prices, for the purpose of meeting every variety of lettering and ornamenting, but these prices given may be taken as a standard, subject always to the fluctuations of the prices of labor and material.

FRESCO PAINTING,

AND ITS AUXILIARIES COMBINED.

Of all those attainments which contribute as well to the gratification of the senses as to the refinement of the taste and the enlargement of the intellectual powers, the art of Painting is perhaps the best adapted to the human mind.

The satisfaction derivable from the contemplation of a beautiful work of art possesses a peculiar advantage; it is renewable at pleasure without any continuance of the exertion by which it was produced. But a rare combination of talent with industry, or, at least, great industry, can alone lead to productions which may claim admiration beyond the circle of our own partial relatives and friends. Experience has proved the impracticability of conveying a knowledge of the elementary principles of this art, in any manner so as to supersede the useful labors of the drawing

master or teacher, yet there is much to be learned before the pupil can go alone, with confidence, after the period when his attention ceases, and which the limited duration of his lessons cannot include; to this we must attribute the fact that so many who make a fair progress under the master's eye, either never attempt any performance with the pencil after he has ceased to superintend and direct their studies, or finding themselves embarrassed at the outset, abandon the pursuit and fancy "their genius does not lie that way." We will presume, however, that the reader has gone through the usual elementary course of instruction, that he is able to copy with accuracy the outline at least of any object which may be set before him; this and much more may be obtained by any person of moderate abilities by industry, without an iota of that much misunderstood quality genius, which has proved an ignis fatuus to thousands. One of the greatest artists of the day was right when he said: "Nothing is denied to well directed industry; nothing is to be obtained without it." Depend, then, wholly upon your own exertions, and listen rather to the criticisms of the judicious than the praises of those who will flatter you with assurances that you possess intuitive excellences which may render application unnecessary. To recommend a proper course of study will be the most useful purpose to which these pages can be devoted, for it cannot be dispensed with.

Before any attempt be made beyond copying, the student is enjoined to acquire a clear view of the leading principles of perspective on pain of committing absurdities, for which no beauty of color can atone; it will be found less difficult than is generally imagined. Although it would be impossible to compress into our limits all the explanations and diagrams necessary to an illustration of its theory, we shall subsequently offer a few observations which, we trust, will prove beneficial to the student.

There are two points to which we would particularly wish to call attention, because they are errors that greatly retard the progress; one is a want of command of hand, the other, an impatience to produce a finished effect without the systematic and gradual process necessary to the production of a piece of good work.

To remedy the first will require great attention and practice, if the uncertainty of hand or timidity of touch exist in a great degree. It is never found among the artists of necessity, with whom quality of production is an object of importance, as decorative painters, designers for furniture and manufacturers; with these freedom and precision of hand are seldom wanting.

We advise the pupil to study well every line before it is begun, to determine its exact course and bearing; in short, to look from the object to be represented to the surface on which it is to be drawn again and again, until the mind's eye transfer it and the imagination sees it in the place it is to occupy—that is the moment to be seized, and then the quicker the line is drawn the better. Large objects should be copied on common sheets of paper; it is a great check to the freedom of the hand to have your sheets too small, as it has the tendency to produce fear about spoiling your design or drawing. Still avoid the opposite extreme, and remember always that true proportion and correctness is the first principle of the art.

An occasional hour or two would not be misspent if occupied in drawing straight lines perpendicularly, diagonals, parallel to each other, and circles without the compasses.

This observation is applicable to many who would be ashamed of being seen so employed; who have, in fact, attempted to execute a piece of work without sufficient practice in the rudiments of the art.

The second error is even still more common, that is for a painter to proceed to color, or rather to waste his time in shadowing or coloring upon an outline which might mean anything. There is no time in the progress of a piece of work, when the forms of objects can be so conveniently improved, as when they are in a faint outline; a thorough conviction of this, and experience of the pleasure of modeling as it were into substance by shadows, and adding the charms of color to well-studied forms will render patient labor less irksome by anticipation of certain ultimate success.

In your early practice of drawing from solid objects, it would be well to make several studies from a white globe,

placing it in different lights, and having only one window in the room.

You will find that there is but a single spot upon it which can be represented by perfect whiteness; and that all the other rays falling obliquely upon a receding surface, a weakened light is received, diminishing, at last, into absolute shadow, until again relieved by reflection from surrounding objects on the opposite side. A cylinder may be made by a roll of paper, an egg will serve as an oval, and a cone may be obtained by rolling up a sheet of paper in the shape of an extinguisher. Thus the models are easily obtained, and the pupil has but to study them well, and he will imbibe all the principles of light, shadow and reflection.

He may then proceed to the plaster bust, which must be clean and free from dust, as discolorations greatly embarrass an inexperienced practitioner.

The outline should be sketched faintly at first with soft charcoal (that made of the willow is the best), the superfluity of which may readily be removed from the paper by a soft feather duster or a light whisk of the handkerchief, or even a feather, leaving a faint but sufficiently distinct representation. This should be repeated until the pupil is satisfied with the form and proportions, when colored chalk may be used.

A gray paper we prefer, as it forms the most natural medium between the black and white chalk, and must always appear between them. Soft French chalk is the best for general purposes, and the Italian chalk, which is harder, for finishing, or where great neatness is required.

Center pieces for ceilings, scrolls, spandrels, parterres, etc., moldings, copies of the various orders of architecture, viz.: Tuscan, Doric, Ionic, Corinthian, and Composite.

Here the pupil will find a large field for study, and we would strongly recommend that those various orders should be copied from some genuine prints, in parts and in whole, so as to familiarize the eye and cultivate the mind to all the varieties therein contained.

Those lessons in colored chalks are the most ready methods for gaining knowledge in shading, etc., so as to raise any object upon a plain surface, to represent that relief or effect which is wished to be obtained previous to attempt-

ing anything with water colors. For if not very conversant with the true forms of the subject to be painted, the pupil will find himself launched into a sea of trouble from which it will be difficult for him to extricate himself.

Therefore, I repeat, that owing to the difficulty of working colors in distemper upon a ground of the same kind, where any fault, either in tint or position, is by no means easily rectified, the more does the pupil require extensive and laborious practice in coloring with chalks or crayons. Then he will become decided and sure of touch, and make every line tell with masterly effect.

Speaking of the various orders, their prominent distinctions are as follows: Tuscan, of which the usual hight of the column is seven diameters; Doric, eight; Ionic, nine; Corinthian, ten; and Composite, ten.

The Tuscan is quite plain, without any ornament whatever.

The Doric is distinguished by the channels and projecting intervals in the frieze, called Triglyphs.

The Ionic by the ornaments of its capital, which are spiral and are called volutes.

The Corinthian by the superior hight of its capital, and its being ornamented with leaves, which support very small volutes.

The Composite has also a tall capital with leaves, but is distinguished from the Corinthian by having the large volutes of the Ionic capital.

A complete order is divisable into three grand divisions, which are occasionally executed separately, viz.: The column, including its base and capital; the pedestal, which supports the column; the entablature, or part above and supported by this column.

These are again each subdivided into three parts: The pedestal into base or lower moldings; dado or die, the plain central space; and surbase or upper molding.

The column into base or lower moldings. Shaft or central plain space, and capital or upper moldings.

The entablature into architrave, or part immediately above the column; frieze or central flat space; and cornice or upper projecting moldings.

These parts may again be divided thus: The lower por-

tions, viz.: the base of pedestal, base of column and architrave, divided each into two parts; the first and second into plinth and moldings, the third into face or faces, and upper molding or tenia.

Each central portion, as dado of pedestal, shaft of column and frieze, is undivided.

Each upper portion, as surbase of pedestal, capital of column, cornice of entablature, divides into three parts; the first into bed molds, or the part under the corona; corona, or plain face; and cymatium or upper molding.

The capital into neck or part below the ovolo; ovolo or projecting round molding; and abacus or tile. The flat upper molding mostly nearly square.

These divisions of the capital, however, are less distinct than those of the other parts.

The cornice into bed mold, or part below the corona; corona, or flat projecting face; cymatium, or molding above the corona.

Besides these general divisions, it will be proper to notice a few terms often made use of.

The ornamental molding running round an arch or round doors and windows, is called an architrave.

An ornamental molding for an arch to spring from, is called an impost.

The stone at the top of an arch, which often projects, is called a key-stone.

The small brackets under the corona in the cornices are called mutules or modillions; if they are square or longer in front than in depth they are called mutules, and are used in the Doric order. If they are less in front than their depth, they are called modillions, and in the Corinthian order have carved leaves spread under them.

A truss is a modillion enlarged and placed flat against a wall, often used to support the cornice of doors and windows.

A console is an ornament like a truss, carved on a key-stone.

Trusses when used under modillions in the frieze are called cantalivers.

The space under the corona of the cornice is called a soffit; as is also the underside of an arch.

Dentils are ornaments used in the bed molds of cornices; they are parts of a small flat face which is cut perpendicularly, and small intervals left between each.

A flat column is called a pilaster, and those which are used with columns and have a different capital are called antœa.

A small hight of paneling above the cornice is called an attic, and in these panels and sometimes in other parts are introduced small pillars, swelling toward the bottom which are called balusters, and a series of them a balustrade.

If the joints are channeled the work is called rustic, which is often used as a basement for an order.

Columns are sometimes ornamented by channels, which are called flutes. These channels are sometimes partly filled by a lesser round molding; this is called cabling the flutes.

For the better understanding the various orders it will be proper first to notice the different moldings which by different combinations form their parts.

First.—The ovolo or quarter round.

Second.—The cavetto or hollow.

Third.—The torus or round.

From the composition of these are formed divers others, and from the arrangement of these, with plain flat spaces between, are formed cornices and other ornaments. A large space is called a corona if in the cornice; a fascia in the architrave; and the frieze itself is only a flat space. A small flat face is called a fillet or listel, and is interposed between moldings to divide them.

A fillet is in the bases of columns and some other parts joined to a face or to the column itself by a small hollow, then called apophyges.

The torus, when very small, becomes an astragal, which projects, or a bead, which does not project.

Compound moldings are the cyma recta, which has the hollow uppermost and projecting.

The cyma reversa, or ogee, which has the round uppermost and projecting.

The Scotia, which is formed of two hollows, one over the other, and of different centers.

Several beads placed together, or sunk in a flat face are called reedings.

All these moldings, except the fillet, may be occasionally carved, and they are then called enriched moldings.

From these few simple forms, by adding astragals and fillets and combining differently ornamented moldings, faces and soffits, are all the cornices, panels, etc., formed, and the modern compositions in joiners' work, etc., fresco painters, builders, etc., are very numerous, and too well known to need describing.

For human figures or animals, fruit, flowers, etc., the student must supply himself with good specimens, either lithographs or good prints of any kind, and practice from them until he has acquired sufficient knowledge of proportions, form, size, etc., to suit the various positions to which they may be applied; true proportions are of vital importance to the fresco painter, as his drawing will be about the first point of criticism to which he will find himself liable, even more so than to his shading or coloring. For it matters little how well coloring or shading may be executed if the drawing is deficient. Therefore let the pupil persevere in this branch of the art.

In drawing flowers the center should be drawn first, as by spreading outward, the graceful and ever varying forms of nature in every stem and leaf may be more easily expressed.

In the subsequent operation of coloring them they require much more attention than any other part of the work, so as to produce a soft and accurate effect; but not an equal degree of skill and experience to produce a beautiful whole.

In this kind of drawing, as in every other, the first lesson should be obtained by following the draughts of the most skillful masters, comparing their productions at the same time with nature. As flower pieces are inspected with almost microscopic attention the fibers and figure of every leaf must be distinctly expressed. Flowers which do not blow at the same season of the year should never be grouped together.

In drawing fruit great care is to be taking in assorting or arranging them so as to produce the most imposing effect. So place them as regards color, size, etc., with an easy carelessness that they may by such freedom of position aid the pupil in producing a good harmonious painting.

FIGURE PAINTING,

As before stated, requires correct proportions, good coloring, great ease, and a general softness throughout, to be graceful and mellow in tint, avoiding cold or harsh shading, etc., having always in view the fact that this particular branch of the art demands consummate skill and great truthfulness.

OF LIGHT AND SHADE.

When a ceiling or side paneling is drawn out carefully, and the pupil is satisfied that all is in due proportion and correct to the order desired, the next point of consideration will be to judge from what particular side of the room the light falls from and upon the objects drawn, so that all the shadows may fall one way, and of course from the light.

That part of design, panels, scrolls, etc., whose sides are nearest the quarter from which the light comes, must be the brightest, and the remainder must be gradually darkened.

Surfaces which are wished to project being nearer the light than others, must be sharp and well illumined where the enlightened side can be seen. The faintest lines should be put in first, proceeding gradually to the darkest. All shades should be rather too light at first, that they may be worked up gradually to the full effect.

All strong lights must be relieved by deep shades, but it must be remembered that strong reflections diminish and always soften the shades cast by the original light, so as in some instances to make the side of a body which retires from the light brighter than a nearer part.

It is by the reflection of light received from the sky or terrestrial surfaces that the darkest part of cylindrical and globular bodies, is not that which is the most distant from the original light; and from the peculiar nature of the reflection from such surfaces, when the light falls on one side of them, the lightest part is not always that which is nearest the light.

In shading an upright round pillar for example, a small portion of the side nearest the light, supposing the light

to come from one side, should be a little shaded; the next portion should exhibit the strongest light, which in water color will be almost the ground color unless the ground be dark, then it will have to be run in almost pure white.

Then will come the deepest shade, and lastly a shade for the further side somewhat deeper than the one on the side nearest the light. These shades duly softened into each other will give the idea of a round body.

Titian declared that the best lessons he ever received on the distribution of light and shade were derived from studying and drawing bunches of grapes.

Having as briefly as possible laid down the most useful preliminary studies in the art of fresco painting, as far as architecture, light and shade, etc., etc., are concerned, we will now proceed with an outline of the method of preparing ceilings, walls, etc., and also the proper mixtures for laying the grounds, stiles, etc., preparatory to running in the lines to form panels, ornaments and decorations.

If the walls and ceilings are new plaster (that is clean), I would prefer giving them a good coat of paint previous to using the distemper colors, and for the best of reasons, for by so doing you insure against stains or a striking in of your distemper coats, which is very apt to occur if not painted.

The first coat of paint should be mixed about two-thirds turpentine and one-third linseed oil, with as much japan drier as will dry it hard; too much oil would be liable to bear out so as to cause your distemper color to crawl and not lay well, therefore better err upon the other side, viz.: too much turpentine rather than oil.

When thoroughly dry have good glue in readiness, first prepared by steeping it over night in water to soften, then melt in a suitable pot or kettle, and be cautious not to overheat it in melting; in fact it ought never to boil, for boiled glue never works well and soon spoils in mixed color.

Then have good Paris whiting, take as much as you think you will require for the amount of work you intend to first coat, beat it up thick with water, be sure that you have it all reduced to a perfect pulp, no lumps.

Then take a working pail, and put in as much of your

beat-up whiting as will go over your intended piece of work.

Then take the colors required to produce the shade wanted (the colors previously ground in water) and cautiously mix with the hand, which is preferable to a spatula or stick, till you get the shade desired, which you can prove very easily by drying a little on your hand or on a piece of white paper; if too dark, add more whiting, or if too light, more color. When you have got the tint to your mind, take your melted glue and put in enough to bind the color very hard so as not to rise or wash up with your second coat. This you can also test upon a piece of paper before you lay the color upon your plaster, ceilings or walls, for by neglecting to have sufficient size or glue in your color your second coat will mix up with your first, and the two will roll and gather thereby spoiling your work; the result of which will be that you will have to sponge off both coats with water, thus loosing your time and materials, and suffering disappointment and mortification besides, for your neglect.

If all goes well you will find that two coats will be sufficient in the most of cases, and ought to be made a rule as far as possible to manage ceilings with two coats.

Having now got the plane of your ceiling or wall done you now proceed to mix up the color for the stiles or border, and carry out a similar procedure with them until all looks smooth and solid, and if satisfied with the color and its covering qualities you next proceed to mix up all your shades for drawing your moldings as above directed, viz.: run all your light lines first, then the secondaries, deep, etc., relief, etc., until the molding yields a just resemblance to the order required; the corner pieces can now be acted upon, all cut in with the same colors; when the last touches are put in let the edges be cut sharp and crisp, and do not forget the relief shadows to them also. Now examine the whole work carefully so that nothing shall be left undone or forgotten.

CENTER PIECES WITH FLOWERS.

If flowers are to be put in panels, first draw them correctly, then proceed to color them according to nature if so wanted, then lay in a suitable ground around the group up to the molding, let it be a somber neutral color so as to sink the ground and relieve the flowers. If

FLOWERS IN RELIEF,

You work them out in the same colors as was used in the moldings of the ceiling, giving the group a strong relief shade; but do not lay in any other ground but simply the panel color.

Some fresco painters lay such panels in a different color, but I question if that taste adds anything to the general beauty and chasteness of the ceiling; it is too gaudy, too much, to use the vulgar term, "ginger bread style." Yet some parties will have such work, and to please sometimes the artist has to give way; but always suggest, where it is safe to do so, if for no other reason than to put yourself in a proper position before the public on such matters. It is the duty of an artist to state what is the right harmony, etc., whether adopted or not by the employer.

COLOR FOR CEILINGS, WALLS, ETC.

Regarding suitable colors for interior decoration, there is several considerations of importance which must be here noticed.

First, the kind of building and its use, a church, a public hall or dwelling house; also the position of the house in reference to the cardinal points of the compass, north, south, east or west, for the following reasons, viz.:

If a south or west exposure, that portion of the house will have a large share of sunlight, consequently a natural warm glow of heat, while the north and east, although possessed of sufficient light, as a natural result, a certain coolness consequent to the want or absence or nearly so of direct sunlight.

Therefore for south or west exposure it will be seen at a

glance that cool colors must be selected, as a want of this knowledge might cause the most disagreeable feelings to those who had to endure the effects, although they might be altogether ignorant of the cause (by the painter) through neglect, or want of knowing why, this disagreeable feeling was induced.

And vice versa for rooms situated on the north or east side of a house. The colors must be of a warmer shade or tint; thus, during the warm season the effects of color upon the mind is such as to produce an equilibrium.

So that any person passing through a house at any season of the year would not, upon leaving a room on the north or east portion of the house to go into one in the south or west sides, feel any considerable change, if any, it would be but momentary, for the colors of the two would immediately blend or harmonize so as to produce a pleasing sensation. The effect of color thus has the power to some extent to equalize to the senses a feeling of nearly an even temperature.

CHURCH COLORS.

In referring to church decorations, much difference of opinion exists. Many hold as a fixed rule that churches in particular must have a somber monastic gloom. Such take the idea from visiting ancient buildings, the relics of past ages, which, on account of their walls being generally built of stone, and that stone work being the interior finish without plaster, such churches do, no doubt, while lighted by stained glass and heavy stone work in their windows, etc., cast a dull, melancholic gloom. But this result by no means claims it as a necessity that such cold, forbidding colors should be a standard to the present age.

And further we take the ground that dark somber colors have nothing to do with producing religious feelings or awe. Decorations, colors, etc., style or order, ought to be carefully selected and in good keeping, which should be such as to cherish a true sensibility of christian feeling, altogether free from all depressing circumstances or causes such as cold, raw, uncongenial mixtures have the natural tendency to produce upon the mind.

At the same time avoid all such colors as would be suitable for theater decoration. Rather choose a modest, pleasant class of tints, a medium between the two, neither too bright and lively nor too dull and monotonous.

PUBLIC HALLS OR LECTURE ROOMS.

The best class of colors for such buildings are, or ought to be, pleasant, light, agreeable tints, neither too warm, nor in the other extreme, too cold. They require to be colors easily lighted, pure mixtures, not muddy but airy. Beautiful gray tints for the ceiling panels; pleasant cool buffs or drabs for the divisions or stiles, which can be broken up well in neutral tints, all combining to produce a sweet harmony.

Ceilings so done require to have the walls in keeping, only giving your colors more tone or force, dividing judiciously the various tints throughout the cornice, etc. Artificial moldings always partake of the color of the stiles, and are always allowed for in drawing out the breadth of your stiles. The order you select will always guide you in finding the various members constituting the molding required, etc.

DWELLING HOUSES.

The interior decorations of dwelling houses admits of more latitude. Here the painter has ample scope for the introduction of variety, as all colors consistent with the art of house decoration can be used with impunity.

Still we would advise that colors of a chaste and pleasant character ought to be the general rule.

Let the panel of the ceiling be of a tone of color agreeable and in unison with all the other arrangements, for instance; ascertain the color selected for the upholstery, carpets, etc. (if already a furnished house), then the colors can be made up in complete harmony. You can judge at once those colors that will be suitable not only for the panel, stile and cornice, but also for the walls; and can also see what the contrasting shades ought to be to give the true tone and character to the whole.

For panels grays of various shades are emp'oyed, vary-

ing from the delicate French white to the decided French gray and lilac, compositions of white, blue, red and black.

As already mentioned, whiting for the base of almost all the shades required. Ultramarine blue, cobalt, Prussian and verditer being the blues generally used. Indian red, Venetian, vermilion, lake, carmine and sometimes orange mineral; but for large surfaces it ought to be avoided, as it will be liable to sink owing to its great density.

The only blacks to be relied on are the blue black and the Frankfort, or pure ivory black. Lamp black ought to be discarded, as it is generally foul and greasy.

Pink or rose tints are got by a mixture of red with white, employing any of the reds most suitable for the shade required; if very rich, carmine or lake, vermilion or Venetian red; Indian red, if not wanted bright.

Greens.—Any good chrome green will answer; mineral and Paris greens are of the first importance when bright greens are wanted, and works very clean.

Buffs or Drabs.—A great variety of shades of that class or color can be attained by a mixture of yellow ocher, red, blue or black. Some introduce umber to great advantage in drabs or buffs. If wanted cool add more blue or black and keep out the red, or subdue it nearly.

Chrome yellow of various shades can be used, and if only used with discretion is a valuable color, but bear in mind that chrome is a color of great strength, and has to be used with caution and judgment.

These shades can also be improved if they are wanted warm and mellow, by the addition of terra de sienna, either in its native raw state, or calcined, known as burned terra de sienna; it gives a fine warm tone to those colors.

If cool buffs or drabs are wanted, umbers can be introduced with effect, both raw and burned, producing great variety of color in mixture with or without yellow ocher, chrome yellow or raw sienna. The Turkey umber is superior to the English or American, being a more pure earth and stands better.

BROWNS FOR SHADING, ETC.

Burnt umber, Vandyke brown, oxyde of iron (commonly called "colcother"), purple brown, burnt ocher, burnt sienna, etc. Burnt sienna and ultramarine in mixture; a beautiful shading color, not too much of the blue to show it.

Always recollect that for ground colors the mixed whiting is the base of composition.

In finishing panel work, where order is not entirely binding, colors can be introduced which has a very fine effect; such as parting lines, sometimes red brown, green or blue.

These are simply to divide contrasting or strong colors, and assist very much in relieving the whole work and general effect. But the pupil must be very cautious in introducing such auxiliaries, for many times good colors, fair workmanship and contrast has been destroyed by such introductions, placing such strong tints where they really were not required, or of an improper tone to produce harmony.

CEILINGS ORNAMENTED WITH GOLD.

Sometimes a ceiling is relieved by gilding. The center pieces, corner ornaments, a member of a molding, etc., are required to be so.

Then the student must select some of the projecting or prominent parts, and having sized in for gilding, after which he must have his cushion, tip, cutting knife, etc., all in readiness, also a ball of soft cotton, large camel hair brush for dusting off all the surplus gold, etc. Then place your gold leaf upon the cushion, take your knife and cut it into strips of a proper size, draw your tip across your hair (having first drawn a piece of pure tallow over the hair so that a slight touch will cause the tip to lift up and carry the leaf to the piece of work to be gilded), then use the ball of cotton to lay it down, and clean off with the camel hair brush, etc.

The size for gilding upon ceilings, etc., when a distemper ground is laid, no oil size can be used without first running all the member in with a preparation sizing such

as gum water, weak glue, or thin shellac varnish (bleached) so as to keep the oil size from staining or running. To obviate this trouble and save time an excellent size for such work can be made by intimately mixing with thick glue a little fine pure honey. This is what is called by the French artists "batture." They contend that this size hightens the color of the gold, and such experience will teach the student is the case; it also gives the gilding a fine luster, closely resembling burnished gilding.

PAINTING VESTIBULES AND HALLS TO STAND WASHING, ETC.

The walls must be prepared with oil paint, same as for any other painted wall, only the last coat must be "dead" or "flat;" that is, no oil used in the last coat, only spirts of turpentine. In the last or flat coat there ought to be a little good pale copal varnish, about one tablespoonful to twenty-five pounds of paint; this gives a better and harder surface to the wall, and bears handling much safer, for no man can fresco a wall entirely free of some casuality occurring, such as charcoal lines to dust off, a drop might fall from the brush, etc., and the varnish will enable the student to wash very lightly if anything should happen to require it.

Before the wall receives the last two coats, let the design or paneling be all correctly drawn out.

Then mix the colors to the required tints (in oil), lay in the panels first; then the stiles, and when thoroughly dry, put on the flat or last coat (spirit color). The work will be dry for paneling in a few days.

MIXTURE OF COLORS FOR THE PANELING OF WALLS OR VESTIBULES.

Common spirits of turpentine for the mixing of the finishing colors is found to work too spare, does not cover very well, and cannot be bound enough to stand the frequent passing upward and downward which is required with the brush in running moldings or lines.

Therefore the following mixture is found to answer the purpose very well, viz.: Turpentine, a little white wax,

a little mastic varnish, and a little fine pale damar varnish. The quantity of the varnish must be very small, otherwise a gloss would be produced which would not die down flat in drying; all that is required by such a vehicle is simply to cause the color to hold or set quickly, so that the work can be more expeditiously carried on.

A little practice will soon teach the student the quantities required, for it is not possible to give correct proportions for those mixtures; besides every painter has some particular mixture to which he prides himself. The above will answer all purposes.

In preparing old walls or ceilings sometimes there are stains, cracks, etc., in the plaster; these can be best seen after the old color has been removed by washing, which must always be done the first thing; then mend all the blemishes in the plaster with size putty if small, or if deep cracks, taking plaster of Paris and a little putty lime, enough merely to keep the other from setting too quick. Damp all the places with a brush and water, then apply the plaster with a small trowel or knife, and finally wash and smooth over the places to make good sound mendings. When dry, give a coat of shellac varnish to all the mendings.

After all the necessary repairs are hard and dry, if the ceiling or wall is not to have a coat of paint, a preparation coat in size will be necessary. This is a mixture of whiting with an extra quantity of melted glue, to which must be added a small amount of alum; give the plaster a full coat of that, allowing a full day to harden before the second coat is applied; in most cases the second coat is sufficient if the first coat has been nearly of the required color. But always have enough of size in the second coat to have it well bound, for it may happen that a third coat may be required to make a good fair surface.

Still it is highly necessary to avoid too much accumulation of color, as it is liable to produce a roughness or harshness, which is at once detected even by the inexperienced eye.

Always give a coat "full flowing." Never attempt to rub out the color, for such scantiness of color will be sure to ruin all your expectations and prove a failure.

NECESSARY IMPLEMENTS.

A marble slab, to grind all the colors not to be had ground at the color shops.

A good pallet knife.

A stopping knife.

A small trowel.

A square.

A set of straight edges.

A T square.

One pair compasses.

One scale for measurement. (Gunther.)

One foot rule.

Chalk line.

Colored chalks or crayons.

Charcoal for drawing lines.

Flat nailed stock brushes, or tin bound.

Round wire bound brushes for cornices, etc.

Sash tools, six sizes, from No. 2 to 8.

Flat French tools for drawing lines, etc.

Round quill or tin bound tools, various sizes, from small to large.

Sable pencils, long and short, to use on scrolls, flowers, center pieces, etc., and various other purposes.

An assortment of wood pails.

Stone pots, large and small.

Tin cups, large and small.

Tin cans, one dozen or two, assorted in size

Step ladders.

Tressels for scaffolds, assorted hights; planks, etc.

One glue pot, double made.

One tin basin, wire bottom, for straining colors after the size is put in to remove any extraneous matter in the color.

Any other necessary article omitted, can be supplied when needed.

And here I would sum up with a few useful remarks by way of conclusion.

Knowledge is the grand element of decision in all things, and no less so in painting; and we should neglect no means placed at our disposal of attaining that element.

The same avenues of information are open to us all that

supplied the minds of Rubens and Titian, if we will but resolve to apply them.

The peculiar feature of fresco painting is what may be called "roughness;" and what some people would apologize for on account of "want of finish," by saying that more finish is important, for that at a distance it would not be seen.

But this is a very unfair and insufficient view of the matter. Not only is there no occasion for more finish in fresco painting; but properly speaking it is highly finished already. It is a mere question of focus.

To finish a piece of work, is to regulate and complete the various parts in conformity to the whole, and this effect once accomplished, all beyond tends to undo instead of completing the painting.

By attempting more finish you would obtain less, for the real finish in fresco painting is gained by keeping the tints bold and firm, that they may blend well when reviewed from a distance.

TO PREPARE TRACING OR TRANSPARENT PAPER.

Take one quart of spirits of turpentine, one quarter of an ounce of sugar of lead finely powdered, shake it up and let it stand for two days; then pour off and add to it one pound of pure Canada balsam, set it in a gentle sand heat and keep stirring it until it is quite mixed, when it will be fit for use. Then have your paper ready on a smooth board, brush it over, and hang it up to dry. In about four days it will be fit for use.

This paper will be extremely transparent. The most suitable paper is bank post, and when for very nice purposes, use fine tissue paper.

COPYING OR TRACING SHEETS.

Take some hard soap and lamp black, and mix them together to the consistency of jelly. Brush over one side of any smooth paper with this composition and let it dry. Place the colored side of this paper upon a clean sheet on

a smooth table; over both these lay any design to be copied, and trace its outlines with a metallic or ivory point just sufficiently blunted to prevent its cutting the paper. The colored paper, wherever it is pressed upon by the point, will make a mark on the white sheet it covers, and the lowermost sheet will by this means receive the whole design.

Black lead, vermilion, or any other coloring matter may be employed.

In copying any ornament from the sheet, use the precaution to fasten your sheets securely, for a shift of any of them would make a false copy.

POUNCING ORNAMENTS OF ANY KIND.

Prick the outlines of any design to be copied with small pin holes, very near to each other. Place the design to be copied upon a clean sheet of paper, and dust it over with finely powdered charcoal from a muslin bag. The charcoal will penetrate through the pin holes, and upon lifting up the pricked paper, the design will be found upon the sheet beneath it. The pricked paper will serve many times, and ought to be carefully laid away for use upon some other occasion.

Correct copies of any scroll or design can be thus transferred to a ceiling or wall with ease, and saves all the trouble and time in repeating drawings.

STENCILING.*

Draw any design necessary to ornament flowered moldings, trusses, friezes, etc., and with a sharp knife cut out the principal parts of the drawing, only leave as much as will connect and keep together the sheet in due form, then take a short brush with the color required, and not too thin, pass over the sheet carefully avoiding the liability of under-blotting, when the design will be painted entire

*How to Prepare Paper for Stenciling.—Coat the sheets of paper with boiled oil first coat, then give them three more coats of oil paint, they will then stand the mixture of the water color and action of the brush.

(with the exception of the small parts where the connections were), which can be touched up with a small brush with the same color.

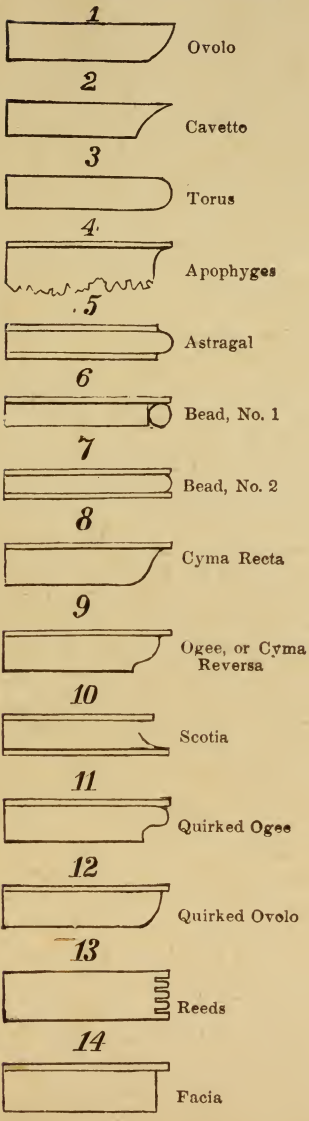
This method saves a great amount of labor, and for such pieces of work answers very well; all that has to be done is simply to put in the shade lines along with the others. Many ornaments are done in this manner, and to the fresco painter is a great economizer of time. Every appliance that can be adopted ought to be brought into requisition to lessen labor, and thereby add to the remunerative interests of physical action.

In conclusion, I would say, persevere and the result is sure.

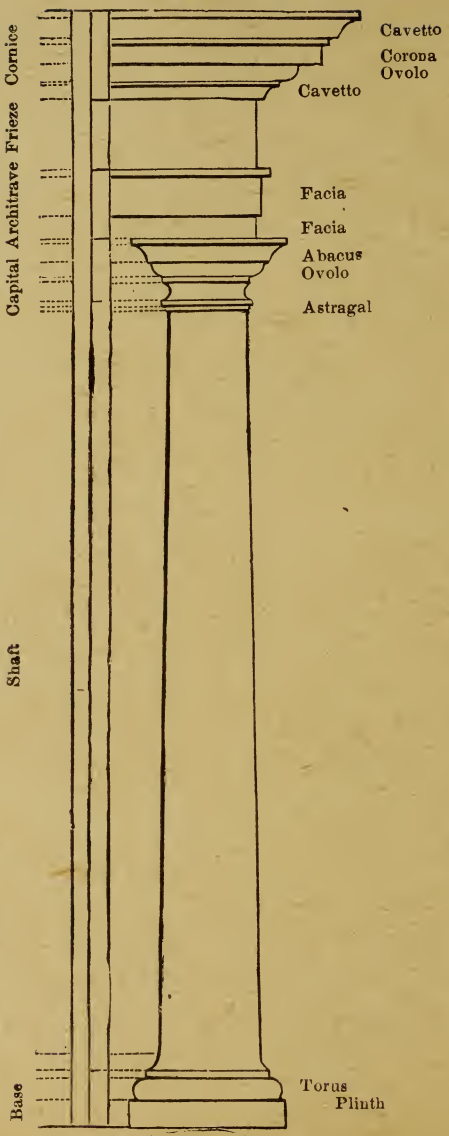
ORDERS OF ARCHITECTURE.

The painter of interiors has constant use for pillars, columns and pilasters. We give, therefore, a specimen column of each principal order of architecture, with the technical designations of each part. The painter must constantly remember that these are only flat representations of solid bodies, and he should study every fine row of columns that may come under his observation, and enlarge his knowledge by the study of some complete work on architecture; and following these pillars we give a few designs for ceilings in fresco. Also an ornamental scroll and a border for several colors. But the painter in active practice will constantly find use for larger collections of designs. He should also be ready with pencil and sketch book to copy anything new which he may see, and to invent designs for himself.

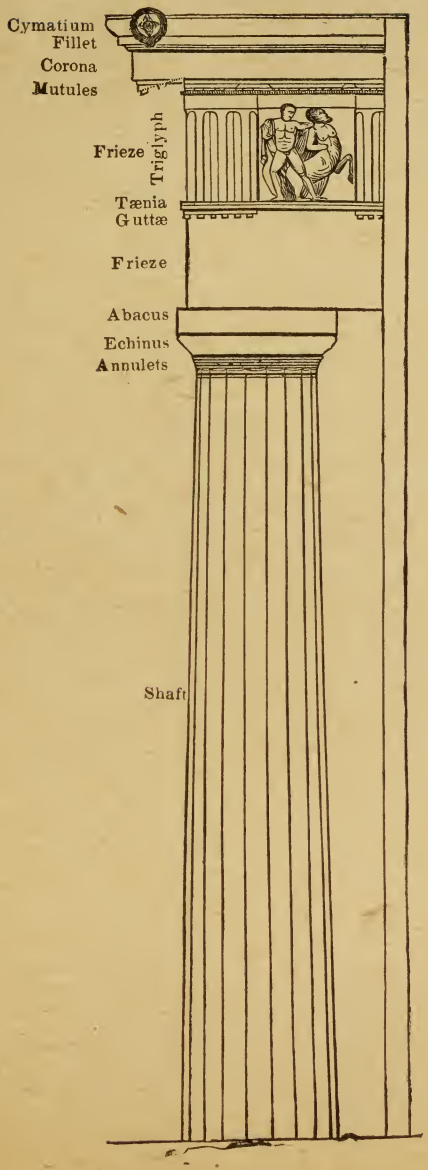
TUSCAN ORDER.



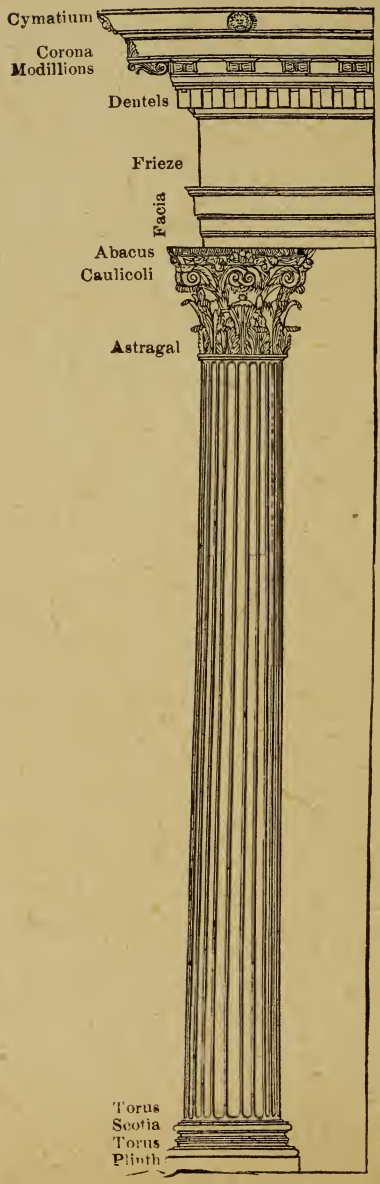
TUSCAN ORDER.



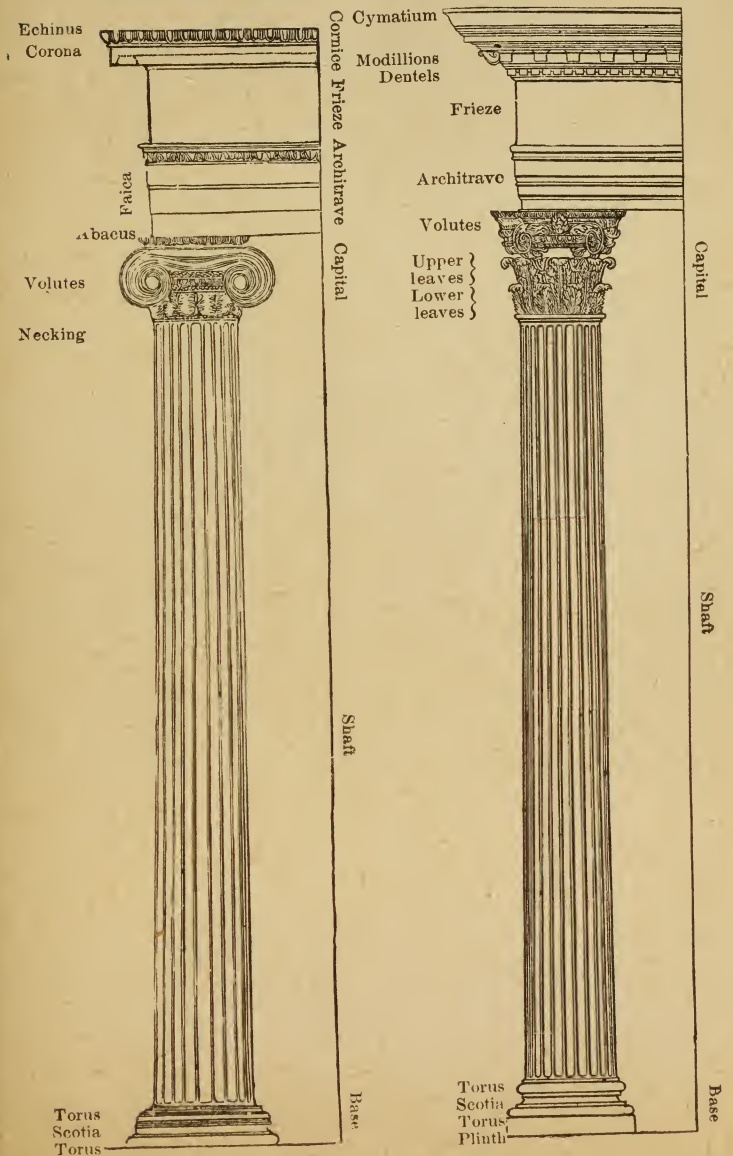
DORIC ORDER.


Cymatium
Fillet
Corona
Mutules
Frieze
Triglyph
Tænia
Guttæ
Frieze
Abacus
Echinus
Annulets
Shaft

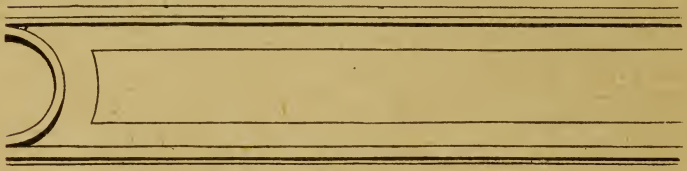
CORINTHIAN ORDER.

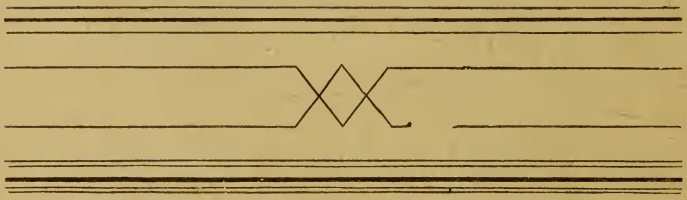


IONIC ORDER. COMPOSITE ORDER.



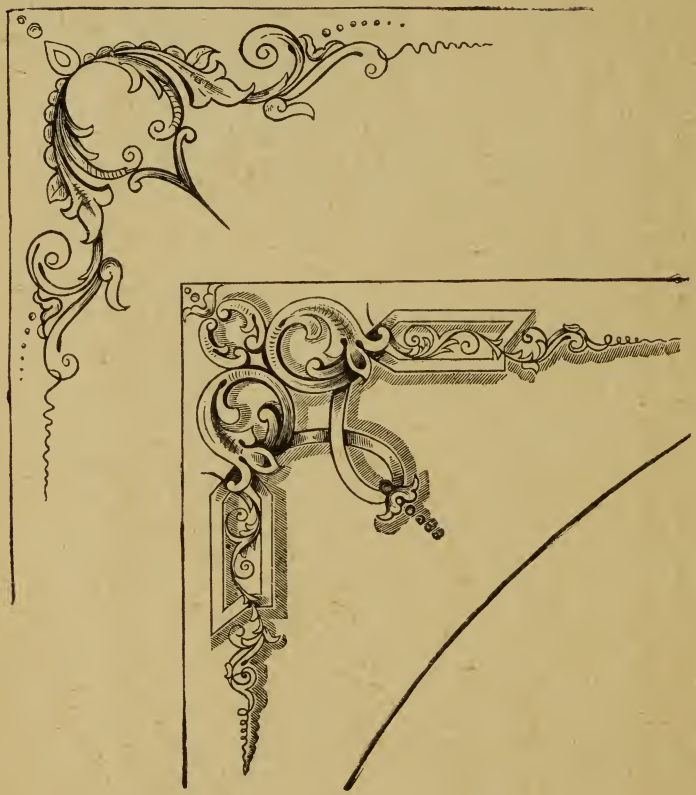
BORDERS.



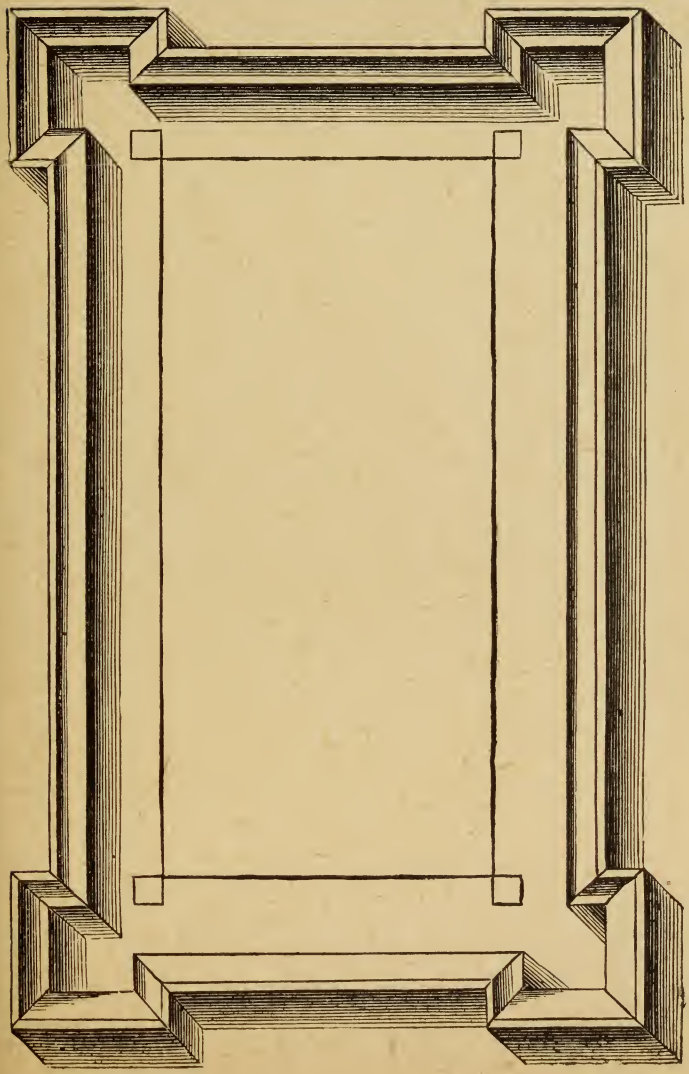


COMBINATION SCROLL.

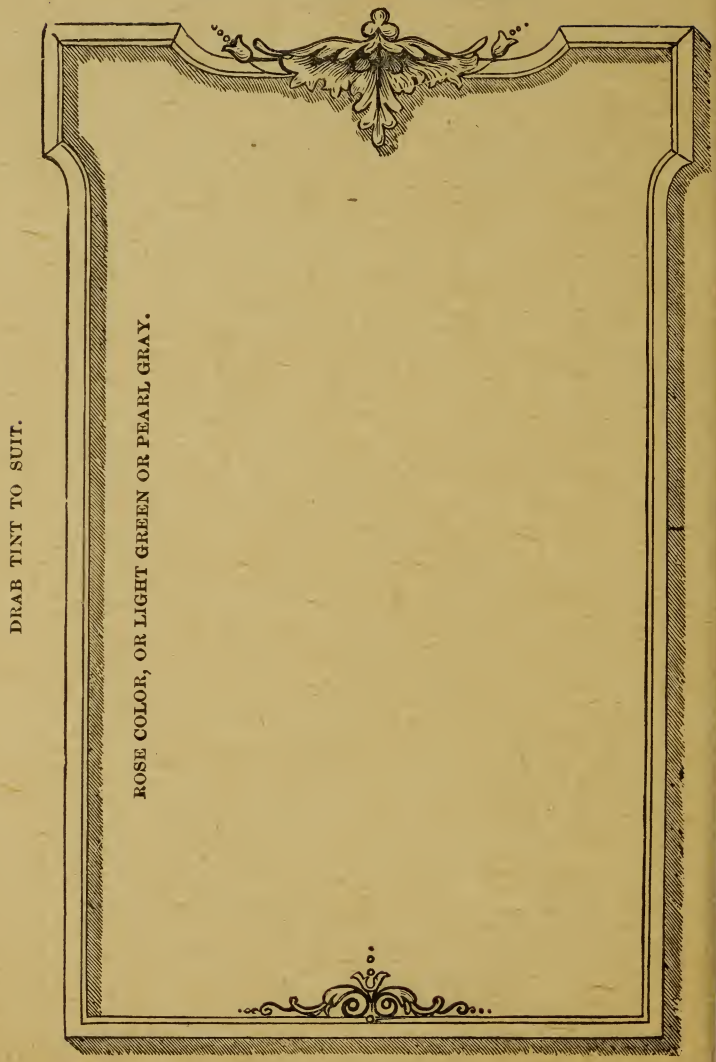
CORNERS.



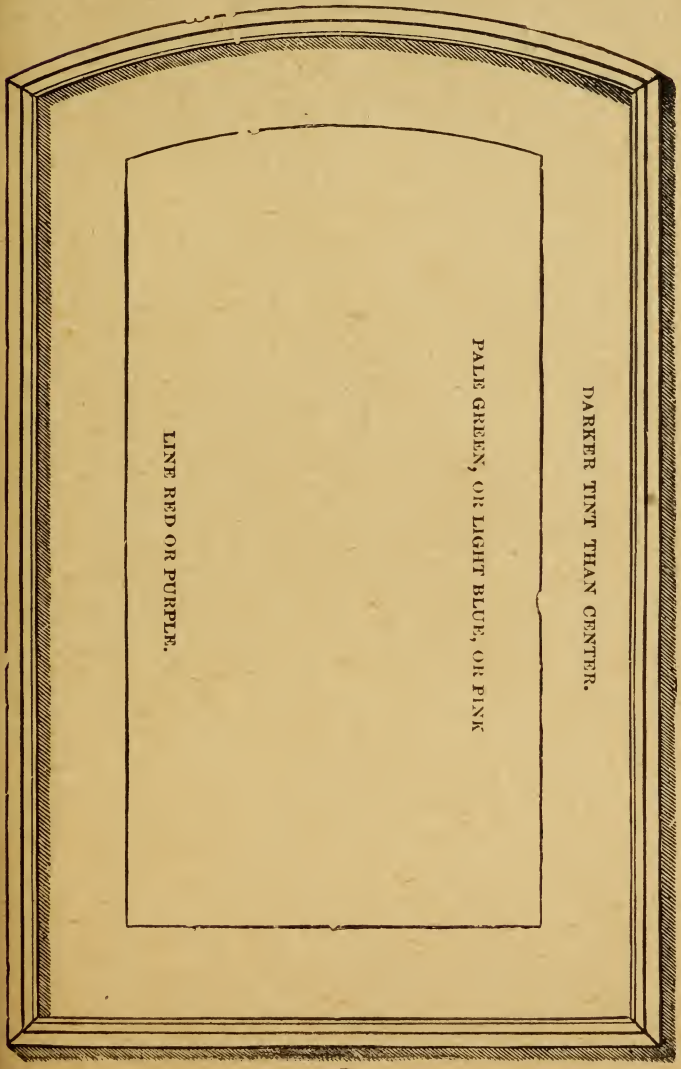
WALL DECORATION IN TINTS.



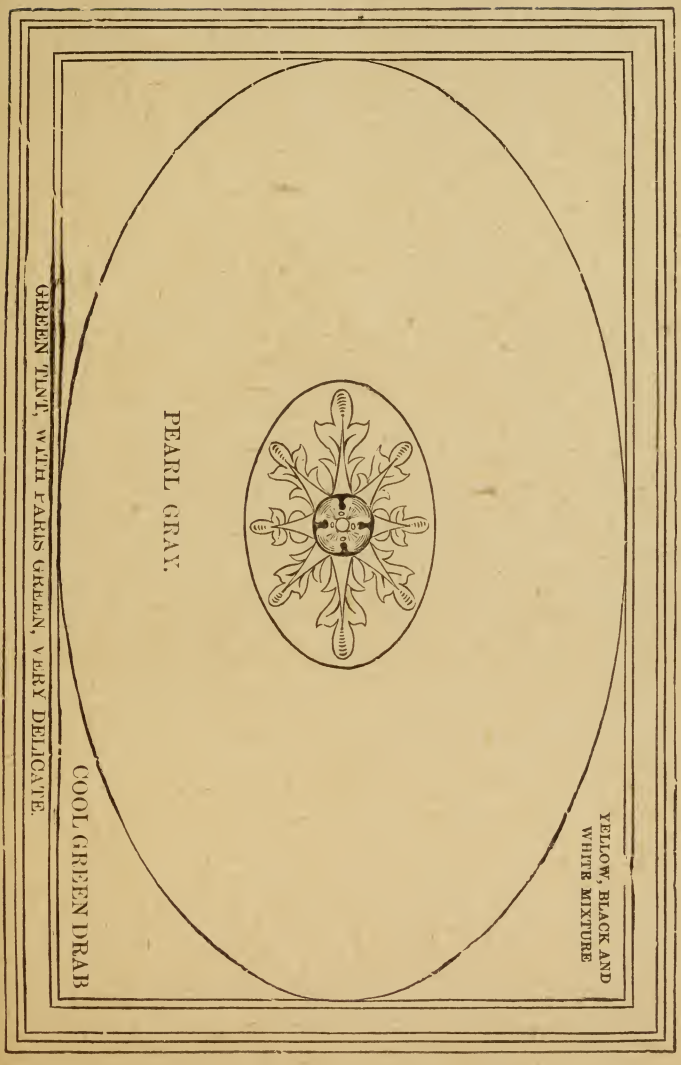
WALL PANEL DECORATIONS.

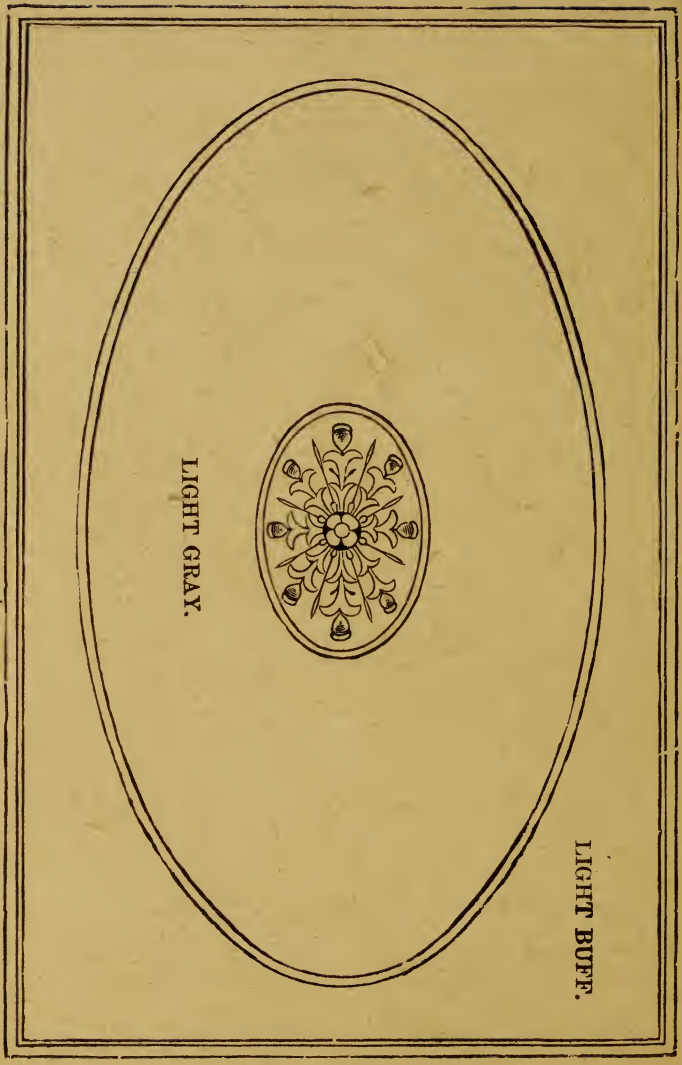


WALL DECORATIONS.



PEARL GRAY.
FRENCH WHITE.
VERMILLION OR INDIAN RED LINE.
BUFF
PEARL GRAY
A BUFF IN HARMONY.


YELLOW, BLACK AND WHITE MIXTURE
PEARL GRAY.
COOL GREEN DRAB
GREEN TINT, WITH PARIS GREEN, VERY DELICATE.
STONE COLOR.


DARK DRAB.
LIGHT GRAY.
LIGHT BUFF.

WARM GRAY DRAB.
FRENCH GRAY.
LIGHT PINK.
(VERY DELICATE).
VERMILION LINE, OR PURPLE BROWN.

A COMPLETE SYSTEM
OF
COACH PAINTING.

THIS is a branch of the art of great importance, yet one but very imperfectly known to the masses. One reason for this statement is that coach painters generally keep a very close surveillance over visitors, few, if any, are allowed to enter their workshops, and no class of painters are so unwilling to communicate any of the principals or theories of their business.

House painting, sign painting, etc., are branches of the art that cannot be well concealed from the public gaze, for the operations are so common, and of every day occurrence, that any person of moderate ability can soon obtain sufficient information to enable them to do a passable piece of work, especially in house painting. Graining requires not only good judgment, a true sense of the various woods and marbles he wishes to imitate; but also the organ of imitation well developed. Sign painting being in part mechanical, has been acquired with more ease than many other branches of the art, yet there are some points got only by long practice and through the help of others in the same line.

But, as stated above, coach painting differs so much from any of the above in the method, mixtures, etc., that even a good clear knowledge of any of the others is of no use when applied to coach painting.

In starting with giving the pupil a correct idea of coach painting, it will be necessary first to mention the kind of materials, tools, etc., required.

In no branch of painting should more care and knowledge be employed than in selecting the most suitable stock before commencing a piece of work; for without paying strict attention to this fact, good work cannot be done. A first-rate coach painter cannot execute a piece of work to

advantage with poor materials; the paints must be of the best quality, varnish, japan, oil and turpentine dryers, etc.; let those be good and the chances are all in your favor.

MATERIALS REQUIRED.

White lead, B. B. brand, ground in oil.
Same quality, dry.
Japan dryer, No. 1.
Black Japan.
Body copal varnish (flowing).
Body (hard), for bringing up the work, for rubbing down and using in the previous coats, then finish with the body flowing.
Carriage varnish. Nos. 1 and 2.
Drop, or Frankfort black.
Chrome yellows, of all shades to orange.
Indian red.
Vermilion.
Venetian red.
Orange mineral.
Red lead.
Scarlet lake.
Crimson lake. } Coach painters' rose pink.
Purple lake. }
Yellow lake.
Carmine
Purple Brown.
Burned Umber.
Raw Umber.
Burned and Raw Sienna.
Chrome greens, assorted shades.
Olive, or quaker's green.
Ultramarine blue.
Prussian blue.
Cobalt blue.
French yellow (ocher).
Whiting, best quality.
Ground pumice.
Pumice in lump.
Rotten stone, very fine.

Tripoli powder.
Granulated zinc (putty powder).
Fine wheat flower.
Olive oil for polishing.
Brushes of suitable sizes, short for painting.
Oval bound varnish brushes.
Sash tools, assorted sizes.
Pencils, large and small (sable).
Long liners for striping (camel hair or sable).
For fine lines, long black sable.
Sand paper, assorted numbers.
Emery paper, for rubbing old work, viz.: iron, springs, bolts, shackles, etc.
Dusters.
A few tressels to stand bodies upon of a suitable hight.
A wheel stand, which is an upright mortised into a square block of wood, about two inches above the half diameter of the largest wheel; have a pin of iron put through the upright, a little less than the size of the axle, and long enough to hold the wheel while painting or when striping. And another, made with a block or stool, with an upright bolt or pin from the center, so as to place a wheel upon a horizontal position.
A bench for the flag and muller. A small paint mill attached to the bench for grinding colors.
A square putty knife.
A diamond pointed putty knife.
A pallet knife.
A flat file.
A half round file. } for cleaning old work.
Flat broad chisel.
Flat scraper, or old plane iron, used when firing off old paint.
Varnish pots (tin), with a wire across the mouth to wipe the brush over.
Paint cans, assorted sizes.
Oil cans, etc., marked for boiled and raw.
Turpentine can.
Japan can.
Cloth, double milled, for rubbing the varnish coats.
Sponge and chamois skin, etc.

Having mentioned almost all the necessaries required to furnish a coach painter, I will now proceed with the general instruction for preparing a carriage for painting.

First, take and dust all the machine carefully before taking it into the paint room. Have two boards like small table tops connected by a bolt in the center, so as to revolve when wanted. Place these upon the tressels, then take the body off the under carriage and set it upon the small tressels before mentioned, then take off the wheels and let the carriage rest upon the axle on a tressel of a proper hight, same as the wheels; take the wheel stand and place upon it one of the wheels, then the work will be all easy of access and ready to commence painting.

In coach painting very little oil paint is required, and here is the difference that occurs between house and coach painting. Only two or three coats of oil paint is sufficient in bringing up the work. This we call priming. Just give as many coats as will carry out a slight gloss, no more.

The best oil for this purpose is good drying oil, say two-thirds oil and one-third turpentine, and have a little of the fine litharge ground into it, about two ounces to twenty pounds of paint. The litharge causes the paint to become hard, and rub down better than if only drying oil alone was used.

We mention litharge because it is the best dryer for this purpose. Patent dryer is, no doubt, convenient, being already ground, but it never dries paint so hard as litharge, nor rubs down with the sand paper so well, being more apt to hang to or clog the paper, and roll or draw upon the work.

After all is first coated and dry, take your sand paper and rub down very smooth, making sure to cut down all inequalities, ridges, or deficiencies in finish by the coach builder, otherwise by neglecting to do so on the first coat, you would have the mortification to find that those places would cut through in your second coat, thus losing your time to a considerable amount.

You now dust your work carefully, and mix up some putty (better make your own) with whiting and oil (raw oil) and about one-fourth part white lead, and work into it while kneading it, a little pulverized litharge to make it

dry good and hard. This is very important, as the putty should be dry, otherwise it would rub up in the process of the work, and spoil the entire job. Observe that the putty must be stiff, and well worked up, before using it. You now take your putty-knife and fill up every crack, crevice, knot hole, etc., etc; level every inequality smooth and fine; study rather to have your filling-up rather higher than otherwise, for you will put that all right when rubbing down the next coat, but if below the level, you have to commence puttying again. That is bad work, so be sure to putty carefully. All this done, then dust off the work again, previous to second coating. Should your color be too stout or thick, thin with turpentine, but be sure not to use thin color, for it not only covers badly, but rubs down very tacky.

For all dark colors, use a dark lead color for your oil coats—"merely black and white," but, for preparing for any such color as light green, let the color be light lead color.

If for a yellow, begin with white, or slightly tinted with a little chrome yellow.

In laying your second coat, be sure to lay it regular, not fat in some places and spare in others, but as far as possible an equal fair coat, and we would wish to guard you against one of the very worst faults a painter can commit, viz.: to leave full or fat edges upon any part of the work, such as the springs, shackles, bolt-heads, or nuts, or any part of the carriage, for if left by neglect, they will tell upon you at some stage of the work, and at a time, possibly, when you cannot well repair the evil done; therefore be careful.

When this second coat is dry examine minutely, that you have missed none of the places requiring putty.

The second coat being thoroughly dry, proceed to rub down with your sand-paper, using a finer quality this time, so as not to cut so deep, hoping that all projections have been cut down upon the previous coats. Now dust off your work, and commence to give the third coat, putting on a very tight coat (that is, rubbing it out well, not too much paint).

After the work is all dry and hard, you next proceed to

giving the filling up coats. Filling is a mixture prepared as follows: Take dry French yellow, litharge, a little white lead, whiting—say about one-sixteenth litharge—a small quantity of white lead, a small amount of whiting; a little red lead will also improve it; take your drying Japan and pour in as much as will nearly mix it; put in a very little drying oil, very careful not to have too much, otherwise the filling will be soft and tough; turpentine to thin to a suitable thickness, to make it spread like a stiff coat of paint. This filling must be laid full, a coat to flow on freely. A little practice is necessary to find out the exact quantities of thinners to be used in mixing good "filling up stuff." After all is right, commence to coat your body, laying it fullest where you see any hollow or want that you cannot putty very well, as this is really its use. Then, if a good job, coat your shafts, springs, wheels, etc., etc., etc., and when all is done over, let it stand until all is perfectly hard (try with your thumb nail); if it feels hard and don't peel up, it will stand another coat.

In the most of cases, two coats of filling will be sufficient. The last coat must be allowed to dry hard, as it has to be all rubbed down with lump pumice stone. Rub the pumice flat upon a stone before you commence rubbing down carriage work.

When the student begins to rub he is to be very cautious to avoid cutting through, and here he will find a "proof" whether or not he has paid attention to rubbing down carefully with his sand-paper, for if he has not, of course his pumice will cut in all places neglected, as stated above.

In rubbing down with lump pumice, you must use plenty water; keep your sponge in your left hand, and supply water whenever required; it will cut quicker, and not be liable to roll up, as it would undoubtedly do if not kept perfectly wet. Draw your finger or side of the hand over the parts you are rubbing and you will see when you have it done enough, that is, all perfectly firm and smooth. Then you have done all that is required. Take your sponge and wash off all the work; wring out your wash leather (chamois) and dry off the job; then if all is perfect, all filled,

the work will feel like a piece of ivory, quite smooth and level.

A panel or piece of coach work cannot be got level or fit for finishing without being filled up by this method, for the grain of the wood will always be more or less seen unless done so.

We now come to the next stage of operations, viz.: color.

Whatever color the carriage is to be painted, the color must be fresh ground, as it is a mixture that drys very quick.

If you want a dark green of the olive shades, you take deep chrome yellow and drop black; have your black powdered; mix the two together in a pot with the drying japan, and a little turpentine—not too much spirits at first, as it would not grind well if thin; put your mixture into the bench mill and grind it into a clean pot (always washing out the mill, to keep it clean), then see if the shade is of the kind desired; if too dark, you want more yellow, or *vice versa*; if the color is wanted warm olive or quaker's green, put in a little India or Venetian red.

Now take a clean brush, and make up the color to the proper thickness and commence work at once; as the color drys or sets very quick, be expeditious in laying it on. The same care is not now so necessary as regards fat edges, as the color will all dry hard. Still, avoid all careless or slovenly work; always work clean, if you want the work to look well. A small drop of drying oil can be used in very warm weather, if it should set too fast to allow time to lay the color, yet an expert never uses any oil, and it is better not to use any, unless you wish to let the work stand for a longer period of time than usual. By working the color free of oil, two coats per day can be given easily. Two coats of this color will be sufficient. I have often done a good piece of work with one flowing coat.

All plain colors are done in the same manner; all opaque colors that cover well require no more.

Greens, browns, olives, yellows, etc., etc., but for an ultramarine blue, the work has to be got up very differently.

You must ground up after your filling has been rubbed down, washed, dried, etc, with a coat in "oil," that is not

in "japan," using just so much oil with the color to keep it from setting too quick ; for such colors use sugar of lead for the dryer, in preference to japan dryers, as the color will be purer. Grind some good Prussian blue in oil, then add to a mixture of white lead as much blue as will make a ground dark enough for to bear the ultramarine blue, that is about as dark as you wish the carriage to be when finished. You now proceed to give a nice careful coat over all the work that is to be finished blue. When dry, if solid enough, it will require no more Prussian blue, but generally two coats are required.

When satisfied that your ground is good, take some of the best ultramarine blue, grind it on the stone with a little varnish, pour out some of your body flowing varnish into a clean pot, put in your ultramarine already ground, and with a clean brush mix well the blue with your varnish ; try if there is blue enough in it, and, if all right, commence to give a very regular flowing coat all over, and the colored varnish coat will flow on very evenly and give a tone and transparency, a depth of color which cannot be got by using full ultramarine alone. We always recommend two coats for a coach wanted in this peculiar color, second coat the same as the first, only before giving the second coat rub down all the work with ground pumice and water, with a cloth. You thus remove the gloss, and the next coat will lay and flow better. Let the work stand for a few days, then rub down again with ground pumice and water, wash, and dry with your skin, after which the work is all ready for picking out and striping, of which I will lay down general rules hereafter.

CLARET OR LAKE COLORS.

Your first coat is composed of vermilion and rose pink, in oil, as for blue. Filling all rubbed down, washed, dried, etc., dust clean, then proceed to give a coat ; this you will find to cover very well. When dry, give another light coat ; as soon as hard, rub with ground pumice and water, same process as for blue. Dust clean and nice.

If you wish a very rich light claret, you must calculate not to have too much rose pink in your ground color, for

if you do, you will not get the color you anticipate. But for dark clarets, use considerable rose pink. The student must pay attention to these important hints.

For the light shade, have some scarlet lake; grind in a similar way as directed for ultramarine; take the body-flowing varnish and put in the lake; mix well, and proceed to coat very carefully. This color sometimes takes three coats, but with due care, and a good brush hand, it can be attained with two coats.

DARKER SHADES.

Use more rose pink in the ground. Then, instead of scarlet lake, use the best crimson lake, and in the same manner as for the light claret; two coats will be enough if carefully laid. In all those colors got, the principal idea is to have a solid, true body, not shady but fair.

STILL A DARKER SHADE.

Vermilion, rose pink, a little ultramarine blue, for the ground. This is for a purple shade of claret. Ground good and solid.

Then grind some purple lake, same as above; put into your "body-flowing varnish;" two coats will be enough, if managed well. Should any imperfections appear, give another coat and all will be sure.

TO PAINT A CARRIAGE PURE CARMINE.

This is sometimes required for fancy machines, or fire-engines, hose carriages, etc. Many painters fail in painting with this very valuable color, and also through ignorance of how to use it. They very generally attempt to get the color by the use of the carmine alone. This color, if pure, is worth $3 per ounce.

Ground your work with the best English vermilion; see that the color is complete and solid.

Then take pure carmine, grind in a little drying oil, put it into the body-flowing varnish, and coat very carefully. It will take two coats to produce a solid, pure color.

By this method, one ounce bottle will do a whole machine, thereby saving a large amount of cash for carmine, and time, which is capital, and at the same time produce a very superior color to anything that can be realized from pure carmine.

All the above colors are produced by what is called in the trade, glaizing.

A green can be done in the same way; laying a light green for a ground, then use the green lake to glaize, as in the clarets, carmines, ultramarines, etc.

"JAPAN BROWN."

Grind drop black in japan; add to it a little vermilion, just enough to see it. This makes a very rich color, and looks very well with vermilion lines, or an orange line; either looks well.

OXFORD BROWNS.

Take a little chrome yellow, white lead, India red, best ocher, burned umber, just white enough to be seen; yellow is the principal color; red to warm it, umber to give it the brown tone.

Many varieties of Oxford brown can be made by the adding more or less of the leading colors of the compositions.

CHROME GREENS OF ALL SHADES,

Or greens composed of chrome yellow and Prussian blue. Let all the greens be ground in japan. Being opaque, they all work in that way remarkably well, and by far superior to any attempt in oil.

FAWN COLROS.

Yellow, red, a little black, or a little burned umber may be added, even burned terra de sienna is sometimes put in the mixture. Coach colors vary from the shades in general use by house and sign painters. They are strictly a class of colors peculiar to that branch of the art, and are

tied to no common established rule. I have seen a carriage painted with the cleaning of several pots, forming a color that would puzzle almost the best colorist to imitate, yet it looked first rate, although a nondescript! We advise the adoption of the principle, as it not only produces varieties of color but will be a point of economy of great importance, as much valuable color is often thrown away through this want of judgment, into the common receptacle for all left colors called the "smudge barrel."

DRABS.

Any variety can be made to suit the most fastidious.

Composition drabs, red black, and yellow, umber; also some mineral colors, from which many fine tints can be made. Raw umber and white alone constitute a good cool drab, and can be toned either with a little "chrome," or "red," so as to be either rich, or warm. Any fancy shade of color wanted can be mixed with perfect ease, for very soon the student will acquire sufficient knowledge of color to mix any shade he desires.

A GOOD, DURABLE, CEHAP COLOR.

Vermilion and Prussian blue. This is an easy way of getting at a cheap, rich purple, with a small quantity of white lead.

ANOTHER.

Vermilion and drop black makes a cheap plum brown, or claret; covers well, and looks and stands well, although far deficient to the claret got up by glaizing with crimson lake, already mentioned; but for low priced work looks very well indeed, and will not cost one-half the price; as much time is saved, and the materials moderate.

Having given a general outline of colors, we propose to next point out to the student the manner of "breaking out," or "picking out," as the trade term has it.

That is, laying in the lines or stripes, "blue ground." If a large carriage, with heavy wheels, draw lines (with

japan mixed color) with ground Frankfort black, from three-quarter inch to one inch broad, on every part of the carriage, spokes and springs, filloes, hub, etc., etc., etc., shafts, etc. Then, with a light primrose, or light orange color, draw fine lines about three-eighths or a quarter of an inch from the broad black line, showing that separating distance clear and distinct of the blue between.

And great care is required in drawing the fine lines, so as to have them true and equi-distant. Wherever the broad black line is drawn, carry your two fine lines all through the work, bolt heads and nuts black with one fine line round the edge.

For an extra finish a fine line can be drawn down the center of the black, a deep orange, or pure white, or gold. This style looks very beautiful.

In drawing fine lines, as a general rule, the color is ground in drying oil, as it combines more closely, and gives out from the pencil much better, and makes the lines more regular, although for work in a hurry, where the lines are not required to be so fine, japan color will do.

GREENS.

Generally pick out with black, and if a light green, black lines will be enough. If a little more expense is to be gone to, run up the center of the black lines with a white, and not too fine. This makes a good neat finish.

If a dark green, pick out with black, and run very fine line on each edge of the black, three-eighths of an inch off the black. With a very bright green, that looks very nice indeed, or any other color to suit the taste of the artist.

CLARETS.

Almost all colors of this class are picked out with black. Fine side lines are either vermilion or a rich orange; or side lines of orange, not too dark, and a vermilion line run up the center of the black; or one large black line, with a gold line up the center, about one-sixteenth of an inch strong.

FAWN COLORS.

Pick out with black, fine line with white on each edge, or brown drab shade—any color that will show well and be in harmony.

OXFORD BROWN.

Pick out with black, fine line vermilion or medium tint of chrome yellow with a perceptible touch of red in it. Sometimes part the black line with white down the center.

JAPAN OR PLUM BROWN.

Vermilion line looks best of any color, and for cheap work requires nothing more.

BLACK BOLTS AND NUTS.

Some dark colors (very dark) look well to pick out with drab, or fawn color, edge lines vermilion, center line black. This looks very clean and showy.

OLIVE, OR QUAKER'S GREENS.

Pick out generally with black, fine line with white orange, or light green.

DRABS OF ALL SHADES.

Pick out with black, fine line with vermilion, or orange high colored. Extra finish, center line white.

PURPLE.

Pick out with black, fine line with a bright line of orange or lilac, or with vermilion.

These remarks apply to most of the colors in use by coach painters, although there can still be a greater variety of work done than we can enumerate, which can be put in practice at any time.

The next operation is to varnish. Now, it appears a

simple process, but it requires not only great practice but considerable "knack." One thing must be understood and put in practice, viz.: never use a dirty brush or pot; keep your brush in a narrow tin case or canister in raw oil; cut a hole in the top large enough to admit the handle of the brush, and bore a small hole through the handle to admit a piece of wire to hold it up from the bottom, for if the point of the brush touch or rest on the bottom, the bristles will be turned, consequently will not lay the varnish close and smooth. Wash the brush out clean with turpentine before using.

Then pour into your pot (if for the under carriage) some carriage varnish, and work in your brush thoroughly; then start either upon your wheels or carriage first, it is of no importance which; lay a full coat, never pinch it, for a half coat of varnish is always poor and hasky, and never yields a good gloss. When all your carriage work is done pour back the varnish into your can, then take some body varnish and give your first coat to it also; then let all stand until it is quite hard and dry.

Then take your ground pumice and water and cloth rubber (woolen cloth) and wet it well; then have some pumice on a board or plate convenient, dip the cloth in the pumice and commence to rub every part of the varnish, taking great care not to run through any of the ground, or lines, but merely to remove the gloss. This we call flatting the work. Then wash of all the pumice thoroughly, and dry with the wash leather, which must always be used wet; just wring it out of the water as dry as you can, and it will dry best; never use it dry. You now examine the work carefully, and see if you have cut through anywhere; if you have, you must touch it up with japan color, so as to dry soon, then you can begin your second or last coat.

A very good job can be done with two coats. Give a very full coat, almost to running, and lay it off very clean. When you do the wheels, a full coat, take and spin them upon the standard for some time, indeed until nearly set. This plan is not generally practised, but it gives a very superior gloss, and secures the danger of the varnish running, a very important point, and one not easily got quit of, and about the worst eyesore that can occur.

If this second coat do not please you, flatten the coat again with your pumice, cloth, and water; wash and dry as before, and then give a reasonable coat carefully.

In good jobs, where it is required to be polished, you must commence with fine ground pumice; do not depend upon the fineness of the pumice as sold, but, for this purpose, take and mix with water, then grind it upon the flag very fine, then there will be no danger of scratching.

Rub just enough to bring all to a perfect smooth state, all brush marks removed, then wash very clean and dry well; then dust carefully. But always before washing, drying, etc., sweep out your floor, and sprinkle with water to lay the dust. The same precaution is necessary always before varnishing, for dust getting into the varnish will cause the work to look "seedy," or lousey, as the painters call it.

Your next operation in polishing is to take rotten stone, finely sifted through muslin, and mix in olive oil; take a piece of fine cloth for a rubber, and rub every piece very carefully, which will again restore the gloss by reducing it to fineness again; rub off the rotten stone occasionally with the side of your hand or finger, and you will see if all is polished enough.

Then, if all right, take and wipe off with a piece of soft old cotton cloth, free of dust, then take some fine wheat flour, and a piece of fine flax full of the flour, rub all the work over so as to take up all the oil and rotten stone that is upon the work, then with an old silk handkerchief wipe all the work up pretty smartly, and if all has been done right and with care, the work will have a very fine, brilliant gloss.

Some finish with putty powder, and others use Tripoli instead of pumice. But the above process answers every purpose that is required. But when the work is intended to have a polish and burnish finish, always give an extra coat of varnish, as it is not good policy to attempt polishing on two coats of varnish, for such work is generally left from the brush if clearly varnished.

FACING PUTTY FOR SMALL FLAWS.

Mix whiting, a little white lead, litharge a small quantity, with japan dryers, and add a little drying oil—very little; work this very well, not too hard, and use it quickly as it sets very soon. This putty will rub down very soon, and not tear up with the pumice stone or sand paper.

FIRING OFF.

Firing off is a term used by painters. Some use a gas burner attached to a rubber hose pipe, so as to direct it to any portion of the work required to be cleaned off. The heat causes the paint to soften, so that it can be easily removed by the blunt chisel, or plain iron; then can be reduced to evenness by rubbing down with lump pumice and water. Another method is to take a brush with turpentine, lay on a coat upon one part, then, with a match or candle, set fire to it. When the old paint becomes soft enough, blow out the flame, and remove with the chisel, etc. Another way is to hold smoothing irons to the part, and, if very hot, the paint will soon soften so as to be easily removed.

In conclusion, I would state that by attending to the instructions here given, and by a little practice, any man of moderate ability, a steady hand, etc., will very soon have the satisfaction of turning out a good piece of coach-painting. Striping, if well done, tends much to the beauty of the work, so the student will have to practice this department with care. Hold the pencil between the finger and thumb and gauge with the fingers, keeping the thumb uppermost, and drawing the hand backward; by this means he will draw the lines straight and quick—one pencil full will run a whole spoke, from the hub to the feloe, all but a small piece, which he must join, by drawing from the feloe to the line.

CAR PAINTING.

By R. McKEON.

THE PRIMING COAT.—The priming coat of paint on a car is of as much importance as any succeeding one, and perhaps *more*. I have seen good work ruined in the priming by little or no attention being given by the painter to the mixing and applying of the first coat. The foundation is the support, and on that rests your success or failure. The priming should be of the proper materials, and not picked up from old paints which have been standing mixed, and must necessarily be fat and gummy, for such is unfit for use on a good job, and will have a decided tendency to spoil the whole work.

Special care should be exercised as to the priming, and it should be put on very light, so that it may penetrate well into the wood.

If lead be used, two coats should be given to the car before it is puttied, as it is best to fill well with paint the nail-holes and plugs, as well as defects in the wood, so that moisture may not secure a lodgment, which otherwise will cause putty to swell, although sometimes unseasoned lumber will swell the putty, and as it shrinks, the nail remains stationary, and of course the putty must give way.

PUTTYING AND LEVELING THE SURFACE.—In mixing putty, which may be a small matter with some, take care to so prepare it that it will dry perfectly hard in eighteen hours. Use ground lead and japan, stiffening up with dry lead, and whatever coloring you may require in it to match your priming coats. The next coats, after the work is well puttied, should be made to dry flat and hard. Two coats should be applied, and for all ordinary jobs or cheap work, sand-papering is all that is necessary for each coat; but when a good surface is required, I would recommend one coat to be put on heavy enough to fill the grain, and before being set, scrape with a steel scraper. The plain surface is all that requires coating and scraping with the heavy mixture; for this coat, which we call "filling," I use one-half ground lead and any good mineral which experience has shown can be relied upon. This scraping of the panel

work will fill the wood equal to two coats of rough stuff, and saves a great amount of labor over the old process, when so much rubbing with lump pumice-stone was done. Sand-paper when the filling is thoroughly hard, and apply another coat of paint of ordinary thickness, when, after another light sandpapering, you have a good surface for your color.

Rough coating on cars has gone almost out of use, and I believe that but few shops are now using it to any extent. My experience is that paint has less tendency to crack where rough stuff is left off. I do not claim that the "filling" was the principal cause of the cracking, if it was properly mixed, but I believe the water used in rubbing down a car with the lump pumice-stone injures the paint, as it will penetrate in some places, more particularly around the moldings and plugs.

Coloring.—The car being ready for the finishing color, this should be mixed with the same proportions of dryer as the previous coat, or just sufficient to have it dry in about the same time. A very great error with many car-painters is using a large portion of oil in the under coats, and then but little, if any, in the finishing coats; this has a decided tendency to crack, the under coats being more elastic. I always aim to have color dry in about the same time after I have done my priming; by this plan, I secure what all painters should labor to accomplish—very little liability to crack. Work will, of course, crack sometimes, after being out a few months, or when it has repeated coatings of varnish; aud using a quick rubbing varnish on work will cause it to give way in fine checks quicker than anything else. Many of the varnishes we use are the cause of the paint cracking, and no painter has been wholly exempt from this trouble.

Japan Dryers.—The most common cause for paint cracking is poor japan, which is the worst enemy that the car-painter has to contend with; the greater part of the japan that we get is too elastic, and will dry with a tack, and some of the "japan gold-size" we have has the same fault. A little more care in the manufacture of japans would give us a better dryer, and few would object to the additional cost. Japan that I have frequently had I found

to curdle in the paint; it would not mix with it, but would gather in small gummy particles on the top. Work painted with such material cannot do otherwise than crack and scale, and the remedy lies only in getting a good pure article of turpentine japan.

White Lead.—In regard to using ground lead, car-painters differ, as some prefer to grind their own in the shop. I use the manufactured lead, and my reasons for doing so are that it is generally finer than any shop can grind it with present facilities, and it has age after grinding which improves its quality. You can also get a purer lead and with more body than you can by grinding in the shop, which is a fact that most painters must admit; I have tested it very fully, and am convinced on this point.

Permit me to make a few suggestions here in regard to the mixing of paint, which may not fully agree with others' views. There is just as much paint that cracks by putting it on too flat as by using too much oil. I have seen some painters mix their finishing color so that it was impossible to get over a panel of ordinary size before it was set under the brush, and consequently the color would rough up. Color should be mixed so that it will not flat down for some time after leaving it, and then you have got some substance that will not absorb the varnish as fast as it is applied to the surface. This quick drying of color is not always caused by want of oil in it, but because there is too much japan, and a less quantity of the latter will do better work and make a smoother finish. Give your color forty-eight hours to dry between coats; I always give that time unless it is a hurried job and we have very few such jobs in the shop, as experience has fully demonstrated that it is poor economy to hurry work out of the shop before it is properly finished.

Oils.—In car-painting, both raw and boiled oils are used, and good work may be done with either, but I would recommend oil that is but slightly boiled in preference to either the raw or the boiled. After it is boiled, if it is done in the shop, let it stand twenty-four hours to settle, then strain off carefully; this takes out all the impurities and fatty matter from the oil, and it will dry much better, nor will it have that tack after drying that you find with com-

mon boiled oil. Use the proper quantity of dryer in mixing your paint, and a good reliable job will be the result. In car-painting, I would never recommend the use of prepared colors which are ground in oil, as nine-tenths of such colors are ground in a very inferior oil, and they may have been put up for a great length of time, in which case they become fatty and invariably crack. These canned goods do not improve with age as lead and varnish do. Finishing colors should all be ground in the shop, unless special arrangements can be made with manufacturers to prepare them, and the color should be fresh, not over six or eight days old after being mixed and open to the air. Enough may be prepared at a time to complete the coating on a job, but when color stands over a week, it is not fit to use on first-class work, as it becomes lifeless, and has lost that free working that we find in fresh mixed colors; such color may, however, be used upon a cheap class of work, or on trucks, steps, etc., so that nothing need be wasted in the shop.

Varnishing.—Three coats of varnish over the color are necessary on a first-class coach. The first coat should be a hard-drying varnish put on the flat color; the quick rubbing that some use I would not recommend, but one that will dry in five days (in good drying weather) sufficently hard to rub, is the best for durability. After striping and ornamenting the car, and when thoroughly washed, give a coat of medium drying varnish, let this stand eight days; then rub lightly with curled hair or fine pumice-stone, and apply the finishing coat, which is "wearing body;" this will dry hard in about ten days, after which the car may be run out of the shop. It should then be washed with cold water and a soft brush, and it is then ready for the road. In varnishing, many will apply the varnish as heavy as they can possibly make it lie, when, as a consequence, it flows over and runs, or sags down in ridges, and of course does not harden properly; this also leaves substance for the weather to act on. It is better to get just enough on at a coat to make a good even coating which will flow out smooth, and this will dry hard, and will certainly wear better than the coat that is piled on heavy.

Varnishing, we claim, can be overdone, some painters'

opinions to the contrary. We have heard of those who put two and a half gallons on the body of a fifty-foot car at one application, and we have also listened to the declaration made by a member of the craft, that he put two gallons on the body of a locomotive tank. Such things are perhaps possible, and may have been done, but if so, we know that the work never stood as well as it would if done with one-half the quantity to a coat. In varnishing a car, care should be taken to have the surface clean; water never injures paint where it is used for washing, and a proper attention to cleanliness in this respect, and in the care of brushes used for varnishing, will insure you a good-looking job.

Suggestions on Regulation of the Shop.—Perhaps your shop facilities for doing work are none of the best, but do the best you can with what you have; select, if possible, a still, dry day for varnishing, especially for the finishing coat. Keep your shop at an even temperature, avoid cold draughts on the car from doors and windows, wet the floor only just sufficient to lay the dust, for if too wet, the dampness arising will have a tendency to destroy the luster of your varnish. Of course, we cannot always do varnishing to our perfect satisfaction, especially where there are twenty-five or thirty men at work in an open shop, and six or eight cars are under the process of painting, when more or less dirt is sure to get on the work.

A suggestion might here be made to railroad managers, which is, that no paint-shop is complete where the entire process of painting and finishing a car has to be done in one open shop. A paint-shop should be made to shut off in sections by sliding doors, one part of the shop being used exclusively for striping and varnishing. I know from experience that nine-tenths of the railroad paint-shops are deficient in this particular, and still we are expected to turn out a clean job, no matter what difficulties we are compelled to labor under. Many further hints might be given in regard to this matter of shop facilities and conveniences, but as it is not here my object to argue the point, I leave it with this brief mention.

Proper Care of Cars.—In regard to the care of a car after it has left the shop, I think more attention should be

given to this than is done on many roads. The car should not be allowed to run until it is past remedy, and the dirt and smoke become imbedded in the varnish, actually forming a part of the coating, so that when you undertake to clean the car you must use soda or soap strong enough to cut the varnish before you succeed in removing the dirt. Cars should be washed well with a brush and water at the end of every trip; this only will obviate the difficulty, and these repeated washings will harden the varnsih as well as increase its luster.

We know that in washing a car, where soap is required to remove the dirt and smoke, it is almost impossible to get the soap washed off clean, and if it is not, the hot sun and rain will act on the varnish and very soon destroy it.

Cars should be taken in and revarnished at least once in twelve months; and if done once in *eight* months, it is better for them, and they will require only one coat; but where they run one year they will most generally need two coats. Those varnished during the hot months will not stand as well as if done at any other time. Painting done in extreme cold weather, or in a cold shop, is more liable to crack than if done in warm weather.

Paint dried in the shop where there is a draught of dry air passing through it, will stand better than that dried by artificial heat; and you will find, by giving it your attention, that work which has failed to stand, and that cracked or scaled, was invariably painted in the winter season or in damp wet weather. I have paid some attention to this matter, and know the result.

Publishers' Note.—Haney's "Book of Scrolls and Ornaments" has many designs especially for Car painting, and is already adopted in several prominet shops.

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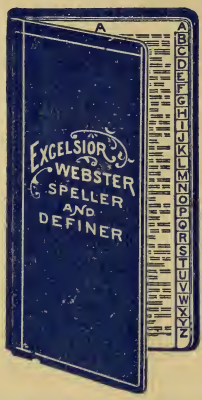

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